The Chemical Age

A Weekly Journal Devoted to Industrial and Engineering Chemistry

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Contents

NOTICES:—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

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The Election

ONE of the interesting features of the Election, looked at from the chemical industry rather than the political point of view, is the way in which some of the leading men in the industry are distributed among parties. The manufacturers supply some of the most pronounced advocates of Free Trade, such as Sir John Brunner and Sir Alfred Mond; Mr. E. Brotherton-Ratcliffe, a chemical merchant, is whole-heartedly with them in an address in which the complete Liberal creed is very well summed up. The manufacturers also supply prominent Unionist and Tariff Reform candidates in Sir William Alexander in Glasgow, and Dr. G. C. Clayton in Widnes. Mr. C. S. Garland (South Islington) and Mr. T. Miller-Jones (Limehouse) also represent the same interests, while Sir Sydney Henn (Blackburn) appeals to the electors as a Conservative Free Trader, and Mr. H. Mond and Dr. J. F. Crowley are among the Liberal candidates. We have seen very little reference to the Dyestuffs Act or the Safeguarding of Industries Act. They are criticised from the merchant side for their hasty construction and bad administration, but an open demand for repeal is rarely heard. It is not clear whether Mr. Asquith and Mr. Lloyd George favour their repeal, but it is significant that Mr. Woolcock, a former Liberal member, who had a great deal to do in marshalling both measures through Parliament, is now appearing on Liberal and Free Trade platforms, and if any question is raised will probably defend his position by pointing to the support which both the Liberal leaders gave to the principles of these two Acts. One notes with interest that a son of Sir Alfred Mond is among the younger Liberal candidates, and with regret that Sir Max Muspratt, owing to local circumstances, has decided not to contest one of the Liverpool divisions. Apart from political considerations, it may truthfully be said that the chemical industry is represented among the candidates by a very strong group of business men of the type much needed in Parliament in the discussion of matters bearing on national trade.

Scope for Petroleum Chemistry

THE question whether the petroleum industry is availing itself to the full of the assistance which chemical science is capable of rendering, is being asked by the chemist with regularly increasing frequency. We drew attention to this matter some two years ago, and advocated intensive efforts towards the development of a petroleum chemistry which should be as fundamental to the industry as coal-tar chemistry is to the manufacture of dyes, etc. The parallel was not, and must not, be pressed too far, but the multitude of potential raw materials which exist in petroleum, should be a spur to intensive effort in the identification, characterisation, and isolation of individual hydrocarbons from the complex mixtures which constitute natural mineral oils.

The entire world output of petroleum can easily be placed, and it is clearly the first duty of the industry so to perfect the methods by which internal combustion engine fuels, lubricating oils, waxes, etc., are produced, that the price to the consumer is reduced to the lowest possible figure. To this end distillation systems have been improved almost out of recognition, and the refiner can adjust his fractions to the demands and fluctuations of the market. Petrol is in demand to an extent which cannot possibly be met by the supplies naturally available in crude petroleum, so that hundreds of millions of gallons are being extracted annually from the natural gas, which may then be used as a domestic fuel, for the production of carbon black, or for the manufacture of methyl chloride, chloroform, methyl alcohol, and so forth. Over a thousand million gallons of petrol were made last year in America by the "cracking" of heavier fractions of petroleum, and all refining problems in connection with cracked petrol appear to have been surmounted. Synthetic lead tetraethyl is being added to petrol in over six hundred towns in the States, and when its adoption becomes still more general and "anti-knock" petrol or its equivalent is the universal motor fuel, the construction of engines with a higher compression ratio will enable the miles per gallon to be doubled.

At the same time, it is almost literally true that we know nothing of the petroleum hydrocarbons. If definite components could be extracted from petroleum, many profitable applications might arise, and their value as starting materials in organic synthesis cannot be estimated. Moreover, the rest of the petroleum would still be available for petrol, lubricating oil and fuel oil manufacture, for only a minute proportion of the present output of oil would be required in the form of individual hydrocarbons or definite hydrocarbon mixtures. The task is one of stupendous difficulty, for the most refined and painstaking fractional distillation fails to separate individual hydrocarbons. Other methods are, however, being investigated, such as fractional precipitation of constituents of an oil-solvent mixture by means of a non-solvent, fractional emulsification, bromination to easily separable poly-bromo derivatives, subsequent debromination, and so forth. Such methods eliminate the change which occurs in medium and high boiling fractions upon distillation, even in presence of steam. It is not possible to discuss this matter of isolation and identification of hydrocarbons at length, nor is it desirable to anticipate the technical difficulties which will arise when industry comes to apply the results of scientific discovery. Enough has probably been said to emphasise the fact that a large organisation will have to be created for the study of petroleum chemistry if progress is to be made.

Silica Gel

It is outside our province to pronounce judgment or attempt to influence opinion on purely commercial aspects of new processes, but attention may be drawn to the claims which Mr. Wilbur Miller, the head of the Silica Gel Corporation, makes in this issue respecting the Corporation's new processes. If only a proportion of those claims can be commercially made good, it is obvious that in the field of oil refining, and in many other directions, the new process promises to be one of great importance. In the early stages of its existence, every new invention has to bear the brunt of criticism, which may be exacting without in any sense being hostile, and those who have developed and financed the Silica Gel process would not, we imagine, resent it. On the contrary, we have reason to think that independent inquiry and investigation have tended rather to confirm their own position. We recently recorded some searching official tests carried out by chemists in the service of the United States Government which yielded entirely favourable results. Investigators interested in other processes aiming at similar results have naturally been at work, but so far as we are aware have not discovered any weakness in the case. Commercial inquiries, too, made quite apart from the promoters, have produced an impression that something of real commercial value has been discovered. Mr. Miller, in his statement, refers to a number of possible industrial applications. His list, however, is not exhaustive, for some independent inquirers regard the application of the Silica Gel process to sulphuric acid manufacture as one of the greatest of its possibilities. What we have said is not, of course, intended to settle the matter, but the instances given are enough to indicate the degree of technical and commercial interest in the subject and to convince one that Dr. Patrick and his fellow-workers on Silica Gel have produced something deserving of serious practical attention.

1873-1923

The completion of the jubilee of the firm of Brunner, Mond and Co. has already been publicly celebrated, but the commemorative volume which the firm have just issued is none the less welcome because it tells the inside story of a remarkable achievement. Apart from the personal aspects of the undertaking and the figures most prominently associated with it, the volume gives in a non-technical form an account of the firm's various processes and gradual developments and extensions. It is interesting to learn, in connection with the company's synthetic ammonia enterprise, that the small experimental plant started in 1922 at the Castner-Kellner works at Weston Point has worked well, "apart from the display of a very few infantile disorders," and has done great credit to all who took part in its design. It is still in operation, steadily yielding a larger quantity of ammonia than it was expected to turn out. It has shown, as was expected, where trouble was likely to arise in the construction and working of larger units. Profiting by the experience so gained, the plans for the Billingham works have been so far completed as to admit of the construction being rapidly pushed on, and at the time the account was written—probably some months since now—it was fully anticipated that the first unit would be started during the current year. The continuation of the Brunner-Mond story in this direction will be awaited with interest.

Great as the purely scientific and technological achievements have been, one feels in reading this volume how much the firm's success has been due to the right handling of human material. Controlled and inspired mainly by members of two families, the company have succeeded in making a family affair of the whole undertaking, and one meets here with abundant evidence of the intimate relations and mutual confidence and respect which have bound the highest and the humblest workers into a real fellowship. Few things could have given the founders more personal satisfaction than this, and perhaps that is as fine a lesson as any which this great undertaking conveys to all other trustees of industry based on science.

Methane by Synthesis

The synthesis of methane from carbon monoxide or carbon dioxide and hydrogen in water gas must always present a fascinating problem for those concerned with the production of industrial gases, for if such a synthesis is proved capable of being carried out with success on a practical scale a means is provided for producing from coke a comparatively high-grade gas without the employment of enriching agents. In actual working, the production in this way of a gas of high methane content presents considerable difficulty owing to the fact that theoretically three volumes of hydrogen are required for one volume of carbon monoxide, while under actual working conditions the necessary proportion is found to be much higher. The main trouble is that in ordinary straight water gas the proportions in which the two gases are present are practically

identical. In connection with this particular synthesis one always has in mind, of course, the work of Sabatier, Elworthy and Vignon, and new interest is now led to the matter by the recent attention which has been accorded it in America.

Messrs. R. T. Haslam and H. O. Forrest have been conducting extended experimental research into the formation of methane in this way when nickel is used as a catalyst. The results presented by these investigators are by no means without interest, and in the main they show that the most desirable temperature for reaction is between 325° and 375° C., while increase in pressure has little effect on the gas produced. At atmospheric pressure and 325° C. a gas containing 40 per cent. of methane with a heating value of 520 B.Th.U. per cubic foot was obtained, and under these conditions the energy loss in the process was 20 per cent. At 330° C. the minimum time of contact to give equilibrium was found to be three seconds, while no carbon was deposited in the furnace. The catalyst, in fact, was unaffected after passing 70 litres of gas over 10 grms. deposited on a refractory brick. As a result of this work it will be seen at once that it has been found possible nearly to double the heating power of the original gas. That is to say, a low-grade gas has been synthetically converted into a comparatively high-grade gas. Thus far the process has its attractions, but the great drawback which must always be faced is that appreciable volume reduction must necessarily follow the reaction ; and, accordingly, on a volume basis the output of a water gas plant would be very considerably reduced.

The Chemists' Wider Outlook

THE speeches at the Chemical Industry Club dinner on Monday evening were mainly concerned with the Club's domestic politics, but two points were of much wider application. The first was Sir Arthur Duckham's plain warning that the chemist of to-day cannot afford to be a chemist and nothing more. Instead of seeking exclusion from the world in his laboratory and uttering his thoughts in his own exclusive language, he must, according to Sir Arthur, learn to speak in a language understanded of the people and link himself up with the engineering and commercial sides if he is to count at his full value. It is advice needing to be given and needing still more to be taken. Sir William Pope, speaking for the professorial class, refused to allow judgment to go by default, but his defence was not very spirited. He himself is not a fair test, for not many of his colleagues can, with the facility he enjoys, pass from the lecture room or the laboratory to the conference or council chamber, thence to a public function or a series of committees, turn up at a dinner in the evening, and finish up with a slashing letter or article for the Press. We think Sir Arthur was right in urging the chemist to come out of his shell. The other point was Mr. Harbord's plea for the recognition by commercial people of the vital importance of research and for adequate financial remuneration for the class whose researches are the life of industry. The only cause for regret was that the appeal fell upon those who entirely agreed with him, instead of reaching the captains of industry many of whom need conversion.

B.D.C. Reconstruction

IT is officially announced that a scheme for the reorganisation of the capital of the British Dyestuffs Corporation is under the consideration of the Directors, and that the shareholders will be communicated with at the earliest possible moment that the Board are in a position to place definite proposals before them. Some step of this kind was foreshadowed in Sir William Alexander's address to the shareholders at the annual meeting in July. He then stated that many shareholders and colour users had expressed the view that the capital of the company should be reduced, but he did not consider the moment opportune. The new proposals will be awaited with interest and will prove, we believe, another in a series of progressive steps towards putting the Corporation on a sound economic footing.

Points from Our News Pages

Photographs are published of the chemical leaders standing as candidates in the election (p. 594).

Letters are published dealing with the present position of the British Fine Chemical Industry and other matters (p. 595).

An interview is given with Mr. Wilbur Miller, of Baltimore, U.S.A., head of the Silica Gel Corporation (p. 596).

The speakers at the Chemical Industry Club Dinner included Sir Lionel Phillips, Mr. F. W. Harbord, Sir Arthur Duckham, Sir W. J. Pope and others (p. 602).

A report appears of a lecture given in Birmingham by Mr. V. E. Yarsley on "Colour and Chemical Constitution" (p. 598).

According to our London Market Report the improvement continues and prices are well maintained (p. 613).

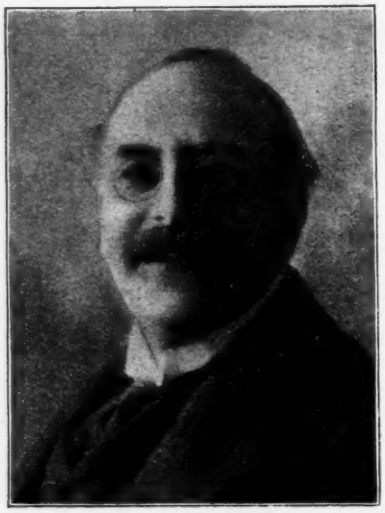
As a result of the German decision regarding reparations, the prices of German products are now materially advanced, according to our Scottish Market Report (p. 616).

The Calendar

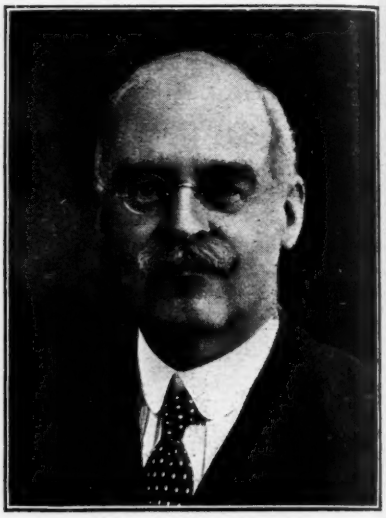
Dec.		
3	Royal Institution of Great Britain: General Monthly Meeting. 5 p.m.	Albemarle Street, London, W.1.
3	University of Birmingham Chemical Society: Lecture by Mr. A. Appleyard.	Birmingham.
3	Society of Chemical Industry (London Section): Ordinary Meeting. 8 p.m.	Burlington House, Piccadilly, W.1.
3	Institution of the Rubber Industry: "Accelerators," Major V. Lefebure. 8 p.m.	Engineers' Club, Coventry Street, W.
5	Society of Public Analysts: Papers by H. Toms, M. S. Salamon, H. T. S. Britton, and R. L. Andrew. 8 p.m.	Burlington House, Piccadilly, W.1.
6	The Chemical Society: Ordinary Scientific Meeting. 8 p.m.	Burlington House, Piccadilly, W.1.
7	West Cumberland Society of Chemists and Engineers: "The Effect of Temperature on Engineering Materials." Mr. W. J. Crutch.	Technical College, Workington.
7	Society of Chemical Industry (Manchester Section): Joint meeting with the Manchester Section of the Institution of the Rubber Industry.	Manchester.
8	Mining Institute of Scotland: General Meeting.	Glasgow.
11	Hull Chemical and Engineering Society: "Recent Advances in the Study of Corrosion." Dr. J. Newton Friend.	Hull Photographic Society's Rooms, Hull.

A Group of Chemical Industry Candidates

Brig.-Gen. Sir William Alexander
U.—CENTRAL GLASGOW



Sir Alfred Mond
L.—WEST SWANSEA

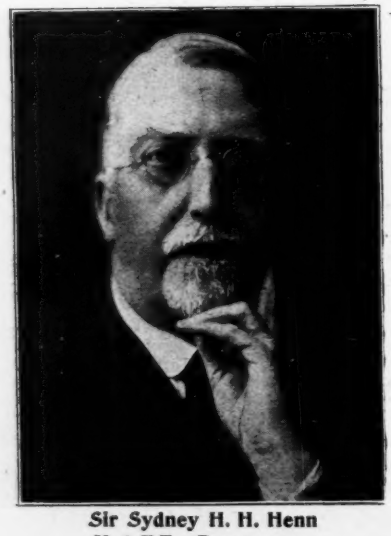


Sir John F. Brunner
L.—SOUTHPORT

Mr. C. S. Garland
U.—SOUTH ISLINGTON

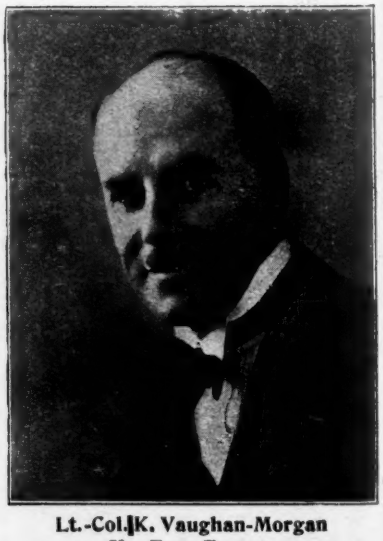
Dr. G. C. Clayton
U.—WIDNES

Mr. E. Brotherton-Ratcliffe
L.—SOUTH ISLINGTON



Sir Sydney H. H. Henn
U. & F.T.—BLACKBURN

Mr. T. Miller-Jones
U.—LIMEHOUSE



Lt.-Col. K. Vaughan-Morgan
U.—EAST FULHAM

The British Fine Chemical Industry

To the Editor of THE CHEMICAL AGE.

SIR,—The war taught us the essential nature of a fine chemical industry. The position in this country when war broke out was that supremacy lay with Germany, and we then found ourselves without many essential substances, of which it is only necessary to mention synthetic and other medicinal chemicals, pure chemicals for analysis and research, chemicals for aeroplane dope, stabilisers for high explosives, and photographic chemicals. A huge effort, regardless of expense, filled the gap, but it was agreed on all hands that never again could England be allowed to revert to the position in which she found herself in August, 1914.

The fine chemical industry, it was resolved, must be established and placed upon a firm basis. It must be on a sufficient scale, so that the chemists, whom it takes years to train in special chemical methods, and the plant employed in the fine chemical industry must be always available. It was found that the fine chemical industry was of such importance that it was a national necessity, even in times of peace. In times of war it was a question of national existence. The arguments in favour of the establishment of a fine chemical industry are so well known and have been so oft repeated that there is no need to state them here again. So cogent are they, and so irresistible, that the Safeguarding of Industries Act was passed by a Government of which Mr. Lloyd George was Prime Minister and Sir Alfred Mond one of his most eloquent lieutenants.

Mr. Asquith had been reported during the last week as having stated that if he be returned to power as head of the Liberal Party he would sweep the Act from the Statute Book. It is well that candidates of whatever political creed and every voter should understand the position.

Circumstances have conspired to mimimise the usefulness of the Act. The country overflowed with stocks of foreign chemicals brought in immediately prior to the Act coming into force. The depressed foreign currency made the 33⅓ per cent. duty of little avail. In addition, there was a period of bad trade generally.

Notwithstanding all these disabilities, remarkable progress has been made. Where 100 chemicals were made in 1913, 1,400 are now being made, and for every ton made in 1913, 2½ tons are being made to-day. Capital has been invested in making extensive additions to buildings and plant. New factories have been acquired, new buildings have been erected, and others are in contemplation, to accommodate additional plant, and to allow for entirely new chemical manufactures which have been taken up. The additional capital sunk down to the present time in buildings and plant amounts to hundreds of thousands of pounds, giving training and employment to a large number of skilled chemical workers.

There are special reasons for retaining this measure on the Statute Book, whatever party is returned to power. Beneficial as the Act has been, it will be still more beneficial. To scrap the Act without putting some other protection in its place would mean giving back to Germany the supremacy in the fine chemical industry which she possessed before the war. In order that the industry may be established in this country it is essential that it be protected either by the Safeguarding of Industries Act or by some other method of protection until it has become firmly stabilised.—I am, etc.,

CHARLES ALEX. HILL,
Chairman, Fine Chemical Manufacturers' Group.

Italian Leucite

To the Editor of THE CHEMICAL AGE.

SIR,—In connection with Professor Hinchley's lecture on Italian leucite, he states that he has difficulty in pumping hydrochloric acid. With the Glandless Ceratherm Pump we are pumping hot *aqua regia* as well as hot hydrochloric acid, and the quantities may be anything up to 300 or 400 gallons per minute at 80 feet head. There is no difficulty about this problem.—Yours, etc.,

GUTHRIE AND CO.

Accrington, November 26.

Institute Examinations

To the Editor of THE CHEMICAL AGE.

SIR,—It may interest your readers, and especially the Fellows and Associates of the Institute of Chemistry and the members of the British Association of Chemists, as well as employers of chemists, to know that it is common knowledge in Liverpool, if not in other sections, that the Council of the Institute of Chemistry is admitting a candidate to a *sort* of examination for the Fellowship of the Institute, apparently contrary to the Charter. . . . We would like to know why this candidate is given special treatment, and we would also like to be convinced that the examination is a fair one. . . . While I was a Member of Council I had dozens of letters complaining that candidates had asked the Council of the Institute to let them sit for the examination, but they were told they had not complied with the preliminaries and would have to do so before they could be admitted. This treatment was most unfair because in the past it had been done.

Personally, I do not mind the present candidate being admitted to the examination if the Charter permits, and providing the Council will give the rejected candidates during these last six years the same privilege if they will consent to accept, but I know many who will not do so now . . . . . Yours, etc.,

G. WATSON GRAY,
Ex-Member of Council of the
Institute of Chemistry.

Chemical Laboratory, 8, Inner Temple,
Dale Street, Liverpool.

[This matter seems to us one for direct representation to the Council or to the various Sections, but our correspondent states his views frankly over his own name, and we give them with the exception of one or two passages.—ED. *C.A.*]

Chemical Laboratory Supplies

To the Editor of THE CHEMICAL AGE.

SIR,—On several occasions I have had the privilege of your columns in which to call attention to anomalies in the chemical laboratory supply trade; and the results have been most satisfactory, responses from new and advantageous sources have come to hand with benefit to the buyers and, I suppose, the seller.

I would like to draw the attention of your readers to the existing absurdity that we cannot obtain sheet metals of definite stated purity. The merchants, who profess to supply chemicals, list sheet metals in their catalogues, but inquiry shows that they have no idea of the purity or otherwise of their own goods. Being in daily contact with the scientific community one would suppose that they might at least find out such details instead of expecting the poor customer to analyse the stuff at his own expense. My own difficulty is with copper sheet of high purity and aluminium sheet as pure as obtainable, neither of which can I obtain of any *stated* purity; so called "pure" copper samples I have had giving 99·75 per cent. only, and the aluminium containing large amounts of iron of the order of 0·9 per cent.—Yours, etc.,

REGINALD G. JOHNSTON,
Scientist in Charge.

Midland Laboratory Guild, Ltd.,
King Alfred's Place, Broad Street,
Birmingham.

Courtaulds, Ltd., in Canada

ACCORDING to *Canadian Chemistry and Metallurgy*, Courtaulds, Ltd., have purchased from the Sun Life Assurance Company of Canada the farm known as French Farm, comprising 240 acres on the banks of the St. Lawrence River, at Cornwall, for the purpose of erecting buildings for the Canadian branch of their business. About 500 persons will be employed. Railway lines are now being laid to the site, so that building operations may be commenced as early in the New Year as conditions will allow.

An Interview with Mr. Wilbur Miller

Silica Gel Prospects: American Chemical Manufacturer's Views on British Business Methods

MR. WILBUR MILLER, President of the Davison Chemical Co. of Baltimore, U.S.A., and head of the Silica Gel Corporation, who returned to the United States by the *Aquitania* on Saturday last, gave, on the eve of his departure, for publication in THE CHEMICAL AGE, some interesting impressions of British characteristics and business methods, and made some important references to certain negotiations for the extension of Silica Gel processes in this country. This was the forty-first visit to England Mr. Wilbur Miller has paid. During his stay he had many opportunities of meeting British chemical manufacturers, was entertained by a distinguished party to dinner at the Reform Club, and left full of appreciation of the kindness shown to him and of the favourable reception given to his business proposals.

British and American Ways Contrasted

Mr. Miller, in the course of a long and quite informal chat, had many things of interest to say. "In the States," he remarked, "the untravelled ignorant American, living a long distance away, is apt to regard the European as behind the times and very backward in taking up new modern methods. I find just the opposite to be the truth. The Continental or the European—and this is especially true of the Englishman—is not particularly interested in big commodity production where quality is liable to be sacrificed to quantity. He builds for permanency, believes in doing a thing absolutely right, and making a good article. The American's idea is to make thousands per day, to get his overhead costs down as low as possible; and to do this he is often prepared to sacrifice quality. His view is that the sooner a thing wears out the better, because then it will be necessary to buy a new one, and something else is always coming along to be considered. But when you get down to fundamental scientific research that makes for better quality and is fundamentally sound, while taking due account of lower costs and better operation from a commercial standpoint, the Englishman is much more interested in that kind of development than the American.

Photo by Lafayette

MR. WILBUR MILLER

"The British people over here have been particularly kind to me in considering some proposals I have had to make in reference to the question of Silica Gel, and have taken, in many cases, a broader view than my own countrymen. I am inclined to think that this is true generally. When it comes to a question of fundamental basic importance to quality the Englishman is always ready to take up any new thing and give it a fair trial.

Tariffs and Anti-Trust Legislation

"I have met quite a number of your chemical manufacturers during my visit," Mr. Miller continued, "and I am inclined to think, although the contrary view, I know, is often expressed, that your people co-operate more loyally amongst themselves than many of our people do. I can speak from some experience as a Vice-president of the American Association of Chemical Manufacturers and a member for many years of the Executive Committee. This, I think, is partly brought about by the anti-trust legislation which operates in the United States. Our corporations, when they act closely together, never quite know what is going to be the result. When you get your own tariff over here you may have to meet similar difficulties. It would be improper for a visitor to intervene in your domestic politics, but if you really want my opinion I think it is quite right that you should protect your own markets, and I think you could protect your own markets without losing your overseas markets. The probability is that under any tariff system certain rings would be formed, and the people may be inclined to start anti-trust legislation of the kind that we have in the United States. If prices should go up the Labour party are sure to call attention to this and probably cause trouble. So it is really a question for the British people whether they prefer a tariff with certain obvious direct advantages to British industries or continue on a Free Trade basis, which would probably allow greater scope for friendly combinations amongst manufacturers.

A British Silica Gel Company

"My present visit," continued Mr. Miller, "has been mainly in connection with Silica Gel, and I think I may say I have concluded everything I came over for. We have closed some big contracts for oil refining units, including plants for the Royal Dutch, the Medway Oil and Storage Co., Ltd., and others. In addition, a number of big contracts have been signed in the States.

"We have decided in favour of the formation of an English Silica Gel company, to be largely owned and controlled by English capital, and there is every prospect of that project going successfully through. Personally, I think Americans have no right messing about in other people's countries. They do not understand the local conditions, and it is much easier and better for English people to do their own business in their own country. Of course the American Silica Gel Corporation will control the general policy, but the English company will be in the closest possible relation with us, and will, of course, have the advantage of our research and general organisation. As an example of the scale of our research I may mention that we have fourteen Ph.D.'s on the staff, any one of whom is capable of holding a full university professorship, and we have also the services of Dr. Patrick, the inventor of the Silica Gel process, and Professor of Physical Chemistry in the Johns Hopkins University. I should say that all that is at present known about molecules he knows."

"Has the Silica Gel process caught on in America? I should say it has very distinctly. We have spent about £350,000 on research and development, and the process is now well out of the laboratory stage and has become a commercial proposition. Our idea has been to produce what may be described as a glass charcoal, impervious to all chemicals, which can be subjected to heat up to 1,000° C. without change of molecular structure. The big concerns we have concluded contracts with do not take things on trust, and it may be concluded that before they took it up we had to supply convincing proofs that our claims could be sub-

stantiated. In addition, the deputation from the Benzol Association which recently visited the States has brought back a 100 per cent. report. Dr. Donnan, one of your greatest physicists, declared in a speech in America that Silica Gel was one of the greatest things done in industrial chemistry for many years."

Industrial Applications

"What are its industrial uses? It is impossible at present to state how far its uses may extend. The process has been described as amounting to a revolution. It was first applied to gas masks, where the ease with which the gel is re-activated over and over again makes it of the greatest advantage. In respect to the refining of oils, we are confident that we shall be able to cut the cost of benzol absolutely in half, and to make a perfect lubricating oil at about the same price as kerosene. As regards petrol, our figures show a saving of 30 cents a barrel, but in lubricating oils we shall be able to save a dollar a barrel. One of the methods of saving cost is in the increase of yield, which amounts to about 6 or 7 per cent. Then there is a very large field of application in connection with the dehydration of air passing through blast furnaces. On a test run made in our commercial plant we had air going in at nine grains and coming out at three grains, and the time of contact between the air entering and coming out was 6/10th of a second. You can imagine the result in blast furnaces taking in 60,000 feet of air a minute.

"One of the things our country is most interested in is refrigeration. It is well known that if you put water into a vacuum and take off 20 per cent. of that water the other 80 per cent. will freeze solid. The problem has always been how to get rid of the vapour coming off the vacuum. Silica Gel, injected into the vacuum, will keep on absorbing the vapour automatically. In submarines, by means of a small motor and a vacuum pump, which the chief engineer could easily fix up, you can obtain refrigeration with Silica Gel at not half the cost of running an ammonia plant. In the States, where ice is in such general use, we expect to be able to put into every house of moderate size a refrigerator plant which will secure a constant supply of ice at not more than £20. We have just completed the first plant for a big steam ocean-going yacht, and the trials, extending over a month, have been a complete success. Our process is excellent for adsorbing solvents, nitrous oxides, refining edible and fish oils, dehydrating air for almost any purpose; in fact, as Professor Donnan said, it seems to have a hundred uses in industrial chemistry.

"A banker in New York remarked to me some time ago that Silica Gel was either nothing or one of the biggest things yet invented. I think we have already demonstrated that it belongs to the 'big thing' class; and the contracts already entered into promise to be the beginning of applications the extent of which cannot now be foreseen."

One gathered from Mr. Miller that the Patents organisation in connection with Silica Gel is usually complete and comprehensive. The firm of Patent attorneys who act for the company have a weekly consultation with the scientific staff, and the greatest care is taken to safeguard the complete security of the processes throughout the world.

Mr. Miller left confident in the strength of his proposition. It may be added, following inquiries made after his departure, that several authorities in this country have been led by independent investigations to the same conclusion.

British Empire Exhibition

THE hours of opening and closing the British Empire Exhibition, which starts at Wembley next April, have now been fixed. The Exhibition grounds will be open from 10 a.m. to 11 p.m., except Sundays. Exhibits will be on view from 10 a.m. to 10 p.m. No exhibitor will be required to keep any machinery moving or full staff in attendance at stalls after 8.30 p.m. from Mondays to Fridays inclusive, or after 9.30 p.m. on Saturdays, but otherwise exhibitors will be expected to keep their exhibits fully on show between 10 a.m. to 10 p.m. In regard to sales, exhibitors will be permitted to arrange their own hours between 10 a.m. and 10 p.m., subject to the provision of the Shop Hours Act.

Commercial Motors at Olympia

A Wide Range of Exhibits

THE outstanding impression which strikes the visitor to the Commercial Motor Transport and Roads Development Exhibition which opened at Olympia, London, on Thursday, November 22, is that the commercial road vehicle is well established and is going to develop. Many of the exhibits are designed for heavy work, no fewer than twelve stands showing six-wheeled designs, and trailers and 6-ton chassis are legion. Many such vehicles are hardly suitable for present-day roads, and it is interesting to note that the gallery of the new small hall is devoted to a series of exhibits illustrative of the road development schemes now being carried out, or projected, which when completed will make road transport of heavy loads more popular than ever.

["C.A." Photograph

A GENERAL VIEW OF THE EXHIBITION

Manufacturers have already realised that a fleet of powerful road vehicles represents a considerable economy over rail transport where comparatively small loads or transhipment are concerned. A variety of bodies are provided for by most makers, and special tipping gear is a feature of many exhibits, among which may be mentioned the Daimler, the Four-Wheel-Drive ("F.W.D."), the Hallford, the Renault, the Saurer, the Scammel, the Foden (steam), and the Sentinel (steam). In the larger sizes hydraulic 3-way tipping gear is usual, but in the lighter types hand-gear is employed, and tipping obtained at the end only. The W. & G. exhibit may be mentioned as showing a special "body" consisting of two Makrob side-tipping 25-cwt. metal containers similar to the tipping tubs used about works.

Charabancs and motor buses form a very large proportion of the exhibits, and it is rather noticeable that few British makers show a lighter chassis than 30-cwt., and American designs such as the Durant, the Dodge, the Overland, and the ubiquitous Ford, seem to have this field almost to themselves, although certain British light car makers have this year produced light delivery vans for loads of 5 to 8 cwt. Among these the Morris, the Rover and the Trojan may be mentioned, each with their special features. The latter is particularly distinctive and worth investigation on account of the number of unusual but well-tried points in its design, which has the experience of the Leyland firm behind it. This class of vehicle is eminently adapted to the needs of the small trader or others desiring to transport small quantities rapidly, and it is somewhat strange that the British manufacturer has only recently catered for this need. The Fiat 10-cwt. and 1-ton vans may be mentioned as examples of the larger type in this category by a well-established firm.

In addition to the road making exhibits in the gallery of the new hall, the gallery of the old hall contains a number of stands devoted to accessories necessary for motoring, such as tyres, lubricating oils, sparking plugs, etc. The exhibits of the Shell, Pratts, Glico, and B.P. petrol companies, and the National Benzole Company are prominent, while one or two lubrication specialists create centres of interest by showing samples of oil in various states of refinement, and in one case the apparatus for determining the flash point, viscosity and other constants of the oil is being demonstrated.

Colour and Chemical Constitution*

By V. E. Yarsley, B.Sc.

CONCURRENT with the increasing knowledge of the relative structure of chemical compounds came the desire to establish a relation between chemical constitution and physical properties. Colour, the most striking characteristic of a compound, was among the first to receive attention. Many attempts have been made by different investigators to deduce a connection between chemical constitution and colour.

The auxochrome chromophore theory of Otto Witt, put forward in 1876, was the first attempt in this direction. Witt suggested that two conditions were necessary to give a substance colour and dyeing properties. (1) The presence of certain groupings of atoms to give a substance a potentiality for colour; (2) it must also possess a salt-forming radical to bring out the colour and dyeing properties. The necessary atomic groupings he termed the "chromophores," while the molecules containing them were the "chromogens." The auxiliary effect of certain groups was usually necessary for the production of colour, these groups Witt termed the "auxochromes." Thus for the development of dyes, auxochromes are necessary, although they are not essential for colour production. This theory was very useful, in that it successfully generalised what might have been merely a disjointed collection of facts.

In 1888 H. E. Armstrong put forward his famous "quinonoid theory," which attributed colour production to the presence of a quinonoid grouping in the molecule. Although it has been shown that many coloured compounds contain the linking, there are many compounds, *e.g.*, primulene, which cannot be arranged so as to contain a quinonoid structure. Subsequent investigators modified the original theory, but these were no more successful than the original.

Observing that the fulvenes, which do not contain the quinonoid structure, are coloured, H. von Leibig suggested that the essential arrangement for colour production is that contained both by the fulvenes and quinonoid compounds, viz., –A–A–A–. This theory successfully explains many curious cases of colour production, but fails to show why such compounds as naphthalene, diphenyl and nitrobenzene, which undoubtedly contain Leibig's essential chromophore, are colourless.

Kauffmann, who examined these substances under the influence of the Tesla rays, postulated that the usual Kekulé arrangement of bonds in the case of these substances is incorrect. Introduction of certain groups, *e.g.*, OH into nitrobenzene, causes immediate rearrangement, with the result that the bonds take up the Kekulé arrangement, and colour results.

This brief consideration of earlier theories shows that speculation based on visible colour alone was unsatisfactory. Although as early as 1879 Hartley had shown that there was a definite connection between constitution and absorption it was not until the early years of the present century that investigators showed any confidence in the theory which he put forward. The failure of early work had served to show that a deeper cause must be sought. The gradual revision of ideas is reflected in the following quotation: "It is now generally recognised that a more precise meaning must be given to the idea of colour than has hitherto been the case. The production of physiological colour, due to the occurrence of absorption in the visible spectrum, is more or less an accidental circumstance. Absorption bands may occur in the ultra violet of equal importance with those in the visible spectrum. In some cases a change in the frequency of the absorbed ray may cause a band to move from the ultra violet to the visible region, without any change in form. A colourless substance may thus be converted to a coloured one without any real change in constitution having taken place, the alteration in the molecule only being of such a nature as to cause a certain retardation of those oscillations within it which give rise to the absorption. A study of the colour of a substance thus involves the examination of its entire visible and ultra violet spectrum, and, as Hartley and his successors have shown, of the change of absorption with the concentration of the absorbing substance." (Chem. Soc. Ann. Rep., 1907.)

*A paper read before the Chemical Society of the University of Birmingham.

Hartley's method of recording absorption spectra is that in general use. The positions of the bands for varying thickness of solution are plotted with wavelengths as abscissæ and thickness of solution as ordinate. A later modification, due to Hartley himself, was to plot frequency with log of thickness. The practical difficulties experienced in detecting the somewhat elusive edge of the band, are eradicated by the use of the spectrophotometer. In this case curves are obtained connecting percentage of light absorbed with frequency.

Many theories have been advanced on the nature of the vibrations causing the absorption bands. Baly and Desch suggested that it was due to dynamic isomerism, whereby a substance underwent tautomeric change from the ketonic to the enolic form. Later, in conjunction with Stewart, Baly pointed out that in cases where true tautomerism was impossible, it was nevertheless possible to imagine a vibration between two forms in which the valencies were differently arranged. Such a molecular rearrangement not involving the migration of a hydrogen atom, they termed "Isorrepesis," and they suggested that this type of dynamic isomerism was responsible for the production of bands. Baly suggested that the residual affinities between the atoms in the molecule unlocked the rigid structure and made possible the isorrepesis within the molecule. On the basis of this theory, colour change in the case of the nitranilines and nitrophenols is readily explained.

The theory gives very little greater generalisation than the older one, but it is notable in that it recognises that not mere orientation, but an internal vibration between the groups in the molecule is the cause of colour.

In that branch of the subject dealing with depth of colour much progress has been made. Nietzki showed that in general the colour of a dyestuff was deepened by adding groups so as to increase its molecular weight, the deepening effect being more or less proportional to the weight of the groups added. This generalisation, known as "Nietzki's Rule," was not based on any systematic investigation and many exceptions have been noted. Schutze pointed out that the effect of an added atom or group depends not on its weight alone, but also on its chemical nature and on its position in the molecule.

It was found that some groups produced a deepening of colour, whilst some had a contrary effect. The former were termed "bathochromic," the latter "hypsochromic."

The auxochromic effect of the NH_2 and OH groups is illustrated in the dyes of the triphenylmethane series; the change in colour with increase in molecular weight being very definite. Other useful series are the alizarine dyes, the colour in this instance varying with constitution, and also with the mordant used. The variation in the latter case has been shown to be due, not to differences in weight, but to difference in the electropositivity of the metallic radical, the colour being deeper the more positive the metal.

Hewitt suggested that the chief oscillation frequency is less, and consequently the colour deeper, the longer the chain of alternate double linkages in the molecule. Watson, in 1914, pointed out that Hewitt's rule must be further qualified in order that it may be generally applicable. He suggested that the conjugated chain required definition, as otherwise, such substances as naphthalene with a fairly long conjugated chain would be expected to exhibit colour. A further qualification suggested later was that the conjugated chain must be contained in a quinonoid formula.

Thus we might restate Hewitt's rule "that the chief oscillation frequency is less, and consequently the colour deeper, the longer the conjugated chain contained in the quinonoid formula in the substance." No connection has yet been obtained between the length and nature of the chain, and the wavelength of the light absorbed, although both on theoretical and practical grounds such a relationship is highly probable.

Of specific groups of substances those known as indicators are of fundamental importance. The efficiency of an indicator depends on the rapidity of the colour change on the addition of acid or alkali. The cause of these changes is of great theoretical interest and practical importance, but it still lurks in obscurity.

Ostwald's ideas held the field for rather more than ten years and it was not until 1903 that they were successfully challenged. For the sake of simplicity attention will be confined to phenolphthalein, since this substance played the greatest part in the course of the discussion.

Steiglitz pointed out that it was highly improbable that phenolphthalein, whose molecule contains no chromophoric group, should become red merely by ionisation. From this time ionisation was no longer accepted as being the root cause of indicator colour the possibility of intramolecular rearrangement in the molecule being a much more plausible explanation. The insufficiency of the ionic hypothesis is shown by the series of colour changes observed with phenolphthalein in passing from the mono to the tri sodium salt, and thence again to red mono salt.

Hentzch, upon whose pseudo acid researches the modern chemical theory of indicators depends, showed conclusively that the production of coloured from colourless substances necessitate a change in structure and is independent of ionic action.

Thus we may say that the colour change in an indicator is due to the influence of an elecropositive metal causing structural changes, and the formation of a quinonoid grouping. As a secondary process we get the formation of ions, and these are coloured not on account of ionisation alone, but because they are produced by a coloured salt.

Another group of substances inviting special attention is that which includes fluorescent bodies. Much experimental work has been done and many theories put forward on the relation between fluorescence and constitution. Hewitt suggested that it was due to a special type of tautomerism, called by him "double symmetrical fluorescence." This theory is illustrated in the symmetrical vibration possible in anthracene and fluorescein.

Kauffmann extended his examination of substances in the Tesla rays to those exhibiting fluorescence, but although much was observed very little generalisation was possible. The work is being carried forward by McVicker, Marsh, and Stewart, but their investigations are not yet complete.

Thus, in spite of the enormous amount of experimental work which has been done, there does not exist any real relationship between colour and constitution. It is highly-probable that the final theory of selective adsorption will be the one which takes full account of colour as an essentially dynamic property, the molecule being regarded not as a rigid structure, but one capable of rapid oscillations. Working on these lines it may become possible to recognise in a general way the characteristic vibrations associated with specific groups of atoms, and hence to predict colour. (The author is indebted to the standard work of Professor H. E. Watson.)

Sulphate of Ammonia Prices

Progressive Advance up to Next May

THE British Sulphate of Ammonia Federation, in a circular dated November 19, announce a progressive advance in price from £14 16s. for December, 1923, to £15 5s. for May, 1924. The circular states:—

"We give you below the prices at which we are prepared to accept orders for sulphate of ammonia for the rest of the present fertiliser season. The average unit value of nitrogen in these prices for neutral quality is only about 14s. 3d., and corresponds to a price of only slightly over £11 per ton for nitrate of soda. When the price of nitrate is £12 per ton as British ports sulphate of ammonia is worth well over £17 per ton delivered.

"It is probable that very little ordinary quality will be available from January/February onwards, as nearly all the large makers now producing ordinary quality should have converted their plants to the manufacture of neutral by that time. Buyers desiring to purchase ordinary quality should, therefore, be prepared to take delivery during December.

"It is understood that quantities purchased at the price stated below will be used for home agricultural purposes only. While it is not proposed under any circumstances to reduce the prices given below, it is possible that they may be increased without further notice.

"We offer to sell sulphate of ammonia for home agricultural use at the following prices:

December, 1923.	January, 1924.	February, 1924.	March/May, 1924.
£14 16 0	£15 2 0	£15 3 0	£15 5 0

per ton for neutral quality in fine friable condition, free from lumps, basis 25¾% ammonia, delivered to consumers's nearest station or wharf in Great Britain for prompt cash payment, in lots of 4 tons and upwards. Limited qualities of ordinary quality will be available, especially for prompt and December, in some districts, and will be sold at 23s. per ton less than the above prices, basis 25¼% ammonia."

Volumteric Estimation of Lead

A Practical Laboratory Method

MOST methods for the estimation of lead in non-ferrous metals are gravimetric, and consist of estimations as lead sulphate, or where the amount is small converting the lead sulphate into lead molybdate. Where the lead content is very small, being only impurities from the spelter used in brass, or small additions made for purposes of machining, the manipulation takes great care, and a considerable length of time, at least two days. Moreover, large quantities of the sample are required to be taken to obtain a convenient precipitate of lead sulphate.

The following volumetric method is both accurate and time-saving, it being possible to estimate the lead content in one working day.

Take one gram of finely drilled borings, and proceed as usual for the estimation of tin. To the filtrate add ammonium hydrate till all the precipitate formed just disappears, leaving the azure solution. Add a good excess of acetic acid, then one or two crystals of potassium chromate, stir, and just bring to boil. Allow to settle one hour. Filter off the chromate, wash with hot water, rinse out the beaker with a little acetic acid before "couching" the last of the chromate on to the paper. Replace the beaker, or preferably a small conical about 350 c.c. capacity, under the funnel containing the precipitate. Dissolve the lead chromate in a few drops of strong hydrochloric acid and *cold* water. To the clear yellow solution add a few c.c.'s of 10 per cent. ammonium acetate to neutralise the effect of the hydrochloric acid, and give a good end-point. Add from one to two grams of potassium iodide, and shake well. Titrate the excess iodine liberated with sodium thiosulphate, using starch as indicator. The solution commonly used for sulphur estimations, 1 c.c. = ·0005 gram sulphur, will do admirably, 1 c.c. being equal to ·002173 grams of lead.

The "thio" is added drop by drop, towards the end, till the last drop is indistinguishable from the rest of the solution. If overdone it can be brought back with the iodine. The change is readily noticeable when finished by adding one drop of iodine and hypo alternately. Using two grams of borings the writer has estimated as low as ·043 per cent. lead. Where the lead content is over 3 or 4 per cent. it is advisable to make the solution, after dissolving the chromate up to 200 c.c. and take half.

Where there is no tin present, the precipitation of the lead chromate can be proceeded with at once. Another advantage of the method is that it shows the presence of lead as a qualitative test, and is adaptable to other materials than non-ferrous metals.

For the use of chemists who have not the strength of "hypo" always on hand, the following solutions are required:

"Hypo" Solution: 8·4 grams of sodium thiosulphate per litre, with 4 grams sodium carbonate. Standardise with "bichrome" solution. The bichromate is made by taking 87.5 c.c. of the solution for iron estimations (1 c.c. = ·01 gram Fe), and make up to 500 c.c. (½ litre).

Twenty-five c.c. of hypo should = 25 c.c. bichromate, using 1 in 5 sulphuric acid, potassium iodide and starch as indicator.

C. U. PRUM.

British Flax Industry

A SPECIAL Committee of the British Empire Producers' Organisation has been investigating the possible development of the flax industry in this country. The committee recommend that a central factory, with capacity to deal with 1,000 acres of cultivation on modern lines, be set up immediately, and hope that sufficient capital will be forthcoming.

A Neo-Shavian Knight-Filtrant's Achievement

A Simulant-Colloid Molecular Water-engine

Randy's Reflexes (VII)

"Our ideas are for the most part like bad sixpences and we spend our lives in trying to pass them on one another.

"An idea must not be condemned for being a little shy and incoherent; all new ideas are shy when introduced first among our old ones. We should have patience and see whether the incoherency is likely to wear off or to wear on, in which latter case the sooner we get rid of them the better."

SAMUEL BUTLER.

WE remember reading, in our youth, a humorous Irish novel, probably one of Lever's, in which there is a character who always sees big—not red: when asked if he had any cards, he replies, if we recollect rightly—hundreds and thousands of packs! Hele-Shaw, being an Irishman, must have had that inspiring character subconsciously in mind—not mere stream-lines. To make his filter-press, he packs hundreds and thousands of cards together vertically. The cards are sheets of a thin, brown, apparently smooth, wood-pulp paper. The sheet was figured in these columns on September 28, together with the filter in elevation. A sheet before me measures about 8½ by 6¾ in. The larger holes in it are about 11-20ths, the smaller about 7-20ths of an inch in diameter. Doubtless, to be scientific, we ought to use mm. if not μ μ—but we don't, having the late Sir Frederick Bramwell's smiling face when lecturing on decimals, in delightful memory. As was shown in the figure, the holes are in two parallel series each larger hole having four smaller around it, equidistant (about 3-10ths in.) from its periphery. The sheets are brought into register by assembling them upon two upright rods, one on each side. Two sets of tubes are thus built up. The pack is between appropriate metal plates and the whole pile is subjected to severe pressure by means of a screw.

The liquid to be cleared is introduced into the large hole system under pressure. Liquid passes in at the periphery of the larger holes and making its way between individual sheets (supposedly in stream-lines) is delivered into the surrounding smaller tubes, whence it is run off. Filtration is at the points of entry, through the circular gaps between sheets. No solid gets in between the sheets of paper when the press is in effective work. At intervals, the solid coating on the walls of the tubes is washed out, if not directly by running some of the filtrate back from the narrow into the wider tubes. The efficiency of the engine depends upon the pressure under which the sheets are placed, *i.e.*, on the distance they are apart: this is regulated to suit the duty cast upon the filter.

All sorts of turbid liquids which resent and resist ordinary methods of filtration are cleared by this Shavian press in a manner altogether magical. Peaty water is made transparent and colourless; turbid oils become bright; no dye-stuff seems able to escape it; wine and beer are turned into water—an unremunerative inversion of the miracle traditionally reported to have happened at Canaan in Galilee, yet an even greater miracle and one of which probably a rational explanation can be given, greater because apparently some of the sugar as well as the colouring matter is taken from the wine. It is said that it will even remove some of the salt from seawater. The Shaw that is known as Bernard may now hide his diminished head—he has but words, no deeds to offer. The deeds of derring-do to be chronicled of our neo-Shavian knight-filtrant, tilting in the field of molecules, are such, in fact, that the imagination pales in contemplation of their possible extent and importance. Still, having to do with an Irishman, what is perhaps more dangerous, an inventor, we will curb our enthusiasm and make no promises until we have trustworthy data to go upon.

Apparently we are in face of a differentiating mechanism comparable with that afforded by charcoal and the partially permeable membranes of animal and vegetable cells. It is not to be treated as a mere gross filter or sieve, as a thing of pores; no, it is a mechanism in which all the forces of osmosis can be put in action: we are in the realm of the Hydronodynast, in fact. Its efficiency will certainly be in accordance with the Duchess's law—the more there is of pressure on the pack the less there will be of "product" in the filtered liquid, *i.e.*, of the originally dissolved substance. Its economic efficiency may be severely limited, on this account.

Our reason for saying this will be apparent, if we consider the mechanism by which, probably, separation is effected. The paper, we hold, has little or nothing to do with the filtration—except as a means of producing an adjustable water-gap. If the paper were smooth and rigid, this would take the form of a ring. As the paper has rugosities, the ring will be broken up and compartmented. Paper is not an entirely neutral substance—so the openings will be hydrolated here and there and, maybe, hydronated, in the manner pictured in the previous article. The heathen author of the Hydronodynamic theory, in his Royal Society communication, calls attention to a possible difference in the composition of the water in drops of various sizes; he suggests that the more minute the drop the richer the water will be in hydrone, therefore in hydronol—that is to say, the more active it will be chemically. Apply this to the pores in the Shavian filter. The smaller the ring-gap or the compartments into which it is subdivided, the more actively the orifices will be guarded by the hydrone molecules acting as sentries. In proportion to their numbers, the sentries will stop would-be intruders; when a full guard is posted, only water (and hormones) will be allowed through. Maybe, the filter-passers will not be hydrone but the less affectionate polyhydrones—for 'T is love, 't is love (residual affinity or lack of it), that will work the trick of passage.

If the filter be an osmotic mechanism, when the orifices are sufficiently small to inhibit the passage of this or that dissolved or semi-dissolved substance, the pressure required to force water through will be at least that corresponding to the attractions offered within the liquid.

For full information, we refer our readers to Lord Berkley and others but may quote the following values for potassium ferrocyanide, by way of illustration—

Grammes per 100 grammes water.	Atmospheres pressure.
13·6	19·25
8·9	13·5
5·6	9·2
3·0	5·4
1·5	2·9

Will alcohol be able to run the gauntlet? Fancy the excitement in the U.S.A., among the Excise authorities, on this issue. If it could be stopped, we can imagine them merely insisting not upon their prohibition but simply upon filtration of all spiritous liquors at entry, the free issue of the filtrate then being allowed—provided nothing were said of the fate of the molecules put under arrest in what Hele-Shaw dubs the sources of the Press, which really are the sinks, as they retain the iniquities. We fear, however, no great demand for the filter will arise on this account. It is likely to be an affair of "pull devil, pull baker," between water and spirit; we fancy that the latter, mindful of the right it has exercised through the ages, will still insist upon going everywhere: where water can go, it will go—though there may be a time-factor, a lag, under some conditions.

Sömmering, a century ago, showed that dilute alcohol might be concentrated by filling a bladder with water and exposing this to the air. Graham repeated the demonstration in 1854, using a septum of gelatin. Dry gelatin, he also showed, drew water from weak spirit. Given time, however, alcohol will come to an equilibrium in the water on either side of a membrane. The effect of pressure is not known, apparently—it should aid the passage of alcohol, we think.

In any case, the pressure required to force water from a solution of a potential electrolyte will be at least that required to overcome the osmotic attraction of the solute and will need to be increased progressively the more concentrated the solution becomes.

We undoubtedly have before us, in this filter, a mechanism which is a close approach to that which regulates diffusion

in living cells. We have termed it simulant-colloid, because our vision of the condition at the pores is that already pictured as the condition at the molecular surface and interfaces of a colloid. It is well said

A Hair perhaps divides the False and True.

The impression upon our mind is, truth being stranger than fiction, that the out-sieving of molecules may well be determined by less than a Hair's breadth, yet in quite simple ways —under guardianship of an omnipotent Hydronodynast, at all times greater than was ever the great Buonaparte.

We pass naturally to charcoal, hitherto all potent as a cleansing agent, whose proud supremacy is now threatened, however. The decolourising power of wood-charcoal was first pointed out by Lowitz in 1791. The greater efficiency of bone-black was discovered by Figuier in 1810; in consequence, it was much used by sugar refiners.

Graham seems to have been the first to call attention, in 1830, to its power of removing saline bodies from solutions. He used a charcoal prepared by boiling ivory-black with dilute muriatic acid. It may be remembered that, in the celebrated inquiry by Hofmann, Graham and Redwood into the alleged presence of strychnine in beer, to detect the alkaloid in solutions, the liquid was digested with charcoal and the charcoal afterwards extracted with spirit.

Graham's account of 1830 is full of interesting statements. He was able to separate a number of metallic salts from solution, especially those of the heavy metals. Suggestive differences were observed—thus, "bisulphate of copper" was not removed but the ammonia-sulphate was completely. Dewar's discovery of the astounding increase in the gaseous absorptive power of charcoal, by cooling it to low temperatures, gave rise to a greatly awakened interest in the subject, which was enhanced when it was known that the efficiency could be raised considerably by long continued heating under special conditions. Important use was made of charcoal in the gas-helmet during the war—in fact, it proved to be the great poison-gas antidote.

How does it act? Who shall say? The all-knowing physical chemist, piously folding his hands together and turning up the whites of his eyes, doesn't merely murmur "Mesopotamia"—he shouts "*Adsorption*." Allah is great and so are the fools of to-day! The number of well-meaning young students lured to intellectual impotency by this blatant term is numberless. There has been no clear understanding, no defined or definable meaning, behind it, either physical or chemical—especially the latter. Fortunately, the wave of insanity is slowly passing away. We are beginning to see the molecules marshalled in order.

The superior efficiency of charcoal—do not let us say carbon, neither is charcoal carbon nor is the property one of carbon —cannot well be dependent upon mere surface. We incline to think it is a consequence of a special cellular structure—of the minuteness of the cells within the solid mass. The fluid within such cells will be of maximum "chemical" efficiency, because of the minuteness of the "drops." Regarding charcoal as consisting of benzenoid (etheno-benzenoid) hydrocarbons of great complexity, we can imagine that such cells are gradually built up (during the ripening process) by a sublimation process; that as the free motion of the highly complex molecules is restrained and restricted, they cannot crystallise regularly together throughout the mass, so here and there they but touch and interstices are left. On this assumption, the charcoal acts through the intense and superior activity of the "water" within its cells. There is evidence, in Adrian Brown's experiments with barley-corns, of a similar condition in the interstices of the starchy mass within the grain. The affinity of dyestuffs for fibres may also be accounted for from this same point of view. We trust these explanations may "wear on."

Here must end our filtration reflex.

"Tarslag"

A POCKET memorandum pad, of a particularly neat type, bound in leather, is issued by Tarslag (1923), Ltd., of Stockton-on-Tees, the well-known manufacturers of asphaltic slag for roads of "Optimac," a non-slipping mastic-asphalt carpet.

Building Materials from Waste Products

Principal Laurie on Recent Results

PRINCIPAL A. P. LAURIE, of the Heriot-Watt College, Edinburgh, who is Professor of Chemistry to the Scottish Royal Academy of Arts, delivered a lecture before the Academy on Wednesday, November 21, on "Building Materials Made of Waste Materials." Professor Laurie, dealing with the subject from a general aspect, said that we had in this country large accumulations of blast furnace slag, of cinders, and clinker, and in the neighbourhood of Edinburgh of burnt shale, the residue from the stills of the oil industry. There were three ways in which these materials might be utilised—for the production of bricks and of cement, and as aggregate mixed with Portland cement or plaster of paris. The general method adopted for the production of bricks was known as the sand lime process, because in the first instance it had been applied to the manufacture of bricks from sand. Briefly, this process consisted of mixing the aggregate with a certain proportion of lime and water, squeezing it into a brick under very heavy pressure of some 200 tons to the area of the brick, and then steaming under high pressure or in open steaming chambers. Bricks were now being manufactured by this process from sand, blast furnace slag, granulated by being run while hot into water, clinker, town refuse, slate dust, and burnt shale. Cement was being manufactured by two Scottish steel companies from blast furnace slag granulated, mixed with lime, and raised to a high temperature so as to form a clinker in the same way as ordinary Portland cement was manufactured. This cement, known in Germany as iron cement, could be sold in this condition, or could be finally ground with a mixture of a certain proportion of raw blast furnace slag.

A New Cement

Acting on Professor Laurie's suggestion, the Board of Scientific and Industrial Research had made investigations, with the result that they were of opinion that a very useful cement could be made of the burnt shale of the Scottish oil shale dumps by merely grounding with a certain proportion of slaked lime.

The uses of these materials as an aggregate opened the question of how far it is possible to reduce the content of Portland cement and, at the same time, get sufficient strength for building purposes. The objection to the usual building slab made of cement is that, in order to be able to remove it from the machine as soon as made, the content of water has to be kept low, and consequently the crushing strength of the finished slab is also low. Two interesting methods of getting over this difficulty had recently been brought to his notice—one, the Crozite method, by which the cement bricks were sliced off from the bottom of a column of cement and aggregate, and the other method of the Triangular Construction Company, in which a heavy compression was put upon the bottom and top of the slab at the moment of completion. It has been possible in the case of the slabs made by the Triangular Construction Company to reduce the amount of cement to one to twelve of aggregate by their method of manufacture. The manufacture of cement bricks by the Crozite process is being employed on a large scale in America, and the lecturer illustrated the process by means of slides.

The Professor proceeded to say that it might seem out of place to introduce the subject of plaster of paris into a lecture on waste materials, but the building industry was confined in practice to two cementing materials, Portland cement and similar preparations and plaster of paris, and many waste products such as sawdust, disintegrated wood, and ordinary cheap aggregates such as clinker could be utilised in slabs made from plaster of paris. We had large and easily available deposits of gypsum in this country, but the industry had never been developed on the enormous scale which is found in America, and in which all kinds of materials required by the builder had been turned out made from plaster of paris as the cement. This was due to the adoption in America of up-to-date methods of mining, of handling, and of heating the raw gypsum. These statements were illustrated by slides of one of the large plaster of paris manufactories in the United States.

In concluding his lecture, Professor Laurie expressed his thanks to, among others, Mr. Weller, of the Department of Scientific and Industrial Research.

Chemical Industry Club Annual Dinner

Chemists' Relation to Engineering and Commerce

THE fifth annual dinner of the Chemical Industry Club was held on Monday evening at the Connaught Rooms, London. Mr. H. E. Coley (Chairman of the Executive Committee), presided, and the guests included Lord Exmouth, Sir Lionel Phillips, Sir Arthur Duckham, Sir W. J. Pope (President of the Club), and others.

Sir Lionel Phillips, in proposing the toast of "The Profession and Industry of Chemistry," referred to the marvellous advance of chemical and physical science. Fortunately, the chemist had not devoted his time entirely to the development of instruments of destruction in connection with which he had achieved so much during the war, but had made great strides in the production of disinfectants, fertilisers, cleansing materials, dyes, essences and a host of products that had really altered the lives of mankind, and in the present age, probably more than in any other, it could be said that the chemist had become master of matter. This had been done by self-denial, perseverance, contempt for self-seeking secrecy, immense effort, and without recognition or recompense (hear, hear). Chemistry was playing so important a part in our lives that the time had come when the chemist might receive a little more recognition than he had done. With regard to dyestuffs, he had been told that 80 per cent. of the requirements of this country were home-made (applause), and the present price was only 2·5 per cent. greater than that of 1914. The dye industry had been established at a cost of £7,000,000. Research had been the keynote of advance in every way, and in this connection he paid a tribute to Sir Arthur Duckham for his work on the gasification of coal, and to Mr. F. W. Harbord for his work on iron and steel. The chemical engineer had become a very great factor in industry.

Does Research Pay?

Mr. F. W. Harbord, F.I.C., in responding, said there was no profession—not even the engineering profession—which was brought into more intimate relation with all the industries of the country than the chemical industry. Even engineering would have been impossible but for the chemist; without a Bessemer or a Siemens, engineering, as we know it to-day, would have been impossible. Professional chemists had to keep themselves very closely in touch with industry all over the globe; it was their business to place before leaders of industry in this country all new developments and new methods which promised to increase output or reduce costs. Undoubtedly, research was regarded by business men as the unproductive department, and, in a sense, it was unproductive; but that was a very narrow view. No doubt there must be many failures and few successes, but, on balance, it was true to say that some of our greatest chemical industries had been built up almost entirely on the results of research departments. Sir Lionel Phillips, as an old miner, would agree that the business man should regard his research department in the same way that the miner regarded his exploratory work in the mine; he must always keep this development work well ahead of actual mining, and so it must be with research. Business men must be prepared to take risks in this respect. But if business men were to provide facilities for research, then the professional men, if they were to do the work well, must have real and accurate knowledge, controlled by common sense. The one thing that interested the business man, from the works point of view, was "Will it pay?", so that it was no good putting proposals before him unless the whole thing was sound. On the other hand, if industry was to make real progress, and hold its own, it was essential that the best men should be employed; young men with the best brains must be attracted to the profession, and business men must realise that if they were to get the best men they had to pay them (hear, hear), and offer them a career. Another way in which business men might help industry and the profession was by keeping in closer touch with the universities, and advising with regard to the technical courses which the universities provided. They might also open their works to young men from the universities during their vacation; for instance, young men could enter the works each vacation time for two or three months in order to acquire a "works sense." He was not one of those who thought everything that came from America was good; America did some things extremely well, some moderately well, and some very badly, and we had to take the good and leave the bad. However, in America, a young man going into industry had all things open to him, if he had brains, energy, pluck and "go," and if the chemical profession and industry was to attract the best of the young men in this country those young men must have the same chance here. (Applause.)

Chemists must be more than Chemists

Sir Arthur Duckham, who also responded, said he was an engineer who had possibly learned how to talk to the chemist, which was an extremely difficult thing to do. He was very much interested in the chemical industry, and was instrumental, more or less, in forming the new Institution of Chemical Engineers, of which he was the first President. The reason he had taken a part in the formation of the Institution was that he had hoped it would be the last straw, in the way of institutions and societies, which would break the camel's back, and would "bust the lot." He was certain that all present would agree that there were too many societies and institutions, and the time had arrived when there should be some merging of their activities. They could no longer be chemists and nothing else; they must be something more than chemists—a part of the industrial machine. Chemists had to link themselves up to the engineering profession, the accountancy profession, and so on, and could not exist as chemists *qua* chemists. He had made his chief chemist his chief operating engineer; industry had to be made to pay, it had to be made a live thing, and they could not have any watertight compartments. Many works in this country were inefficient, and the message he had to convey to his hearers was that he would rather see efficient combination and good production than protection.

The Club's Place in Chemical Industry

Sir William Pope (President of the Club) proposed the toast of "The Chemical Industry Club." After expressing his appreciation of the fact that he had been elected President, he said the Club was looked upon as providing a social link between all the great interests of chemistry, the great corporate interests which were represented by the large chemical societies, and all chemists who had the interests of chemistry at heart hoped that, sooner or later, they would be able to convert all those societies into one great homogeneous whole, housed in a palace which, however magnificent, would never be quite appropriate to what chemists deserved. The membership of the Club included a variety of different types—the chemical manufacturer, the business man, and the down-trodden professorial class, which he had the honour more intimately to represent. The Club had been going on for, roughly, five years, and had become very important; he believed that it was going to become a sort of "key" club to the whole of the chemical fraternity. But the members ought to conserve very carefully a recollection of the men who founded it, in face of a good deal of opposition—he believed he was in the opposition; at any rate, he was usually—and should be everlastingly grateful to those men. They had started from absolutely nothing in the way of a social bond of union among chemists, but had created, in a comparatively short time, a corporate social interest in chemistry which certainly did not exist before.

The Chairman, in responding to the toast, said that it had always seemed to him that those connected with the industry, and particularly the profession of chemistry, were so immersed in knowledge that they had no time to rest; but it was the object of the Club to provide them with a resting place in which they would have an opportunity of relieving their minds of the constant strain to which they were subjected. It was also the endeavour to make a Club in which every member was equal; they had appealed to nobody for support financially, and had never, so far as he knew, endeavoured to push any particular person forward because he had been an officer of the Club; that seemed to him to be one of the greatest

successes achieved. There had also been democratic control, and he hoped sincerely that that democratic control would be continued in the future, so that it could never be said that the Club had been run for any particular person's advantage. As to the opposition referred to by Sir William Pope, he said the Club was formed largely because of the suspicions to which those connected with the chemical industry were subjected. He believed that in connection with chemical matters generally people had been kept too much in the dark as to what was going on. As to the future, he believed that on the Club the chemical industry could build a real organisation which would be an honour to the industry, and a centre for the whole industry and profession. The Club was the one concern connected with the industry and profession which was unbiassed and uninfluenced by any particular person or persons connected with the trade, and it was on that, he believed, that the future Club would be built.

Mr. W. Cullen proposed "The Guests," to which Professor J. W. Hinchley responded.

Mr. A. G. Craig proposed the final toast, "The Chairman," and on behalf of the members of the Club presented to Mr. Coley a gold half-hunter watch, as a mark of appreciation for his untiring work ast he Club's first Hon. Secretary.

The Chairman, in returning thanks, said that the Club had been part of his life for seven years, and he had given up the work because he had felt that he could not carry it on as it should be carried on. His seven years of service were the most pleasant he had ever experienced.

Finally, on the proposition of the President, the company drank to the health of Mr. F. Ward (Steward of the Club), in appreciation of his services.

Trader's Review of the Dyestuffs Act

Criticism of Administration

MR. F. T. T. REYNOLDS, chairman of Millwards Merchandise, Ltd., and acting-chairman of the British Chemical and Dyestuff Traders' Association, contributes to the *Manchester Guardian* a detailed criticism of the Dyestuffs Act, which he treats as illustrating the results of a Protective policy.

"Strong as is the case against the administration of the Safeguarding of Industries Act (he states), the working of the Dyestuffs Act is proving even more objectionable and detrimental to the trade of the country. The principle of embargo is in itself highly objectionable, and in connection with this Act has proved disastrous. Many traders have been practically ruined. If this were a case of a minor ill being perpetrated to accomplish a major benefit there might be some consolation to be derived from it, but any benefit accruing is almost negligible in contrast with the inconvenience, annoyance and the actual restraint and diversion of trade. The Act was passed without adequate consideration. It is true the subject had been in the background for a considerable time, but, like so many matters dealt with by Act of Parliament in recent years, it was rushed through the House in a sudden spasm of activity, and no time was allowed for effective amendment or revision.

"In operation, as seems to be inevitable with almost all protective measures, the administration of the Act has fallen more and more into the hands of the permanent officials, who, however able and wishful to be fair, gradually acquire more or less autocratic power. It appears to be quite easy for some interests to get practically everything they desire, whilst other interests, particularly the smaller users, are set a task almost as formidable as trying to squeeze blood out of a stone. It is reported that in France and Italy and other parts of the Continent the users of colours, either for dyeing or calico printing, are fully employed, and are making great and continuous headway with their export trade in finished textiles, mostly at the cost of the British producers. One of the main reasons for this is that they can obtain whatever dyes and colours they require, and at prices enormously below the prices that have to be paid by British users.

"When the Dyestuffs Bill was being debated in the House of Commons the Government speakers gave repeated assurances that in every case of dispute the English dye-makers would be required to prove that they could offer a product equal to the foreign dyestuff. In the administration of the Act an entirely opposite procedure is adopted. The applicant is required to prove that he cannot get a home-made equivalent. This is quite against the spirit of the Act. Applicants are frequently put off by reference to products of home manufacturers which have little resemblance to the dyestuff required. Apparently any English maker is allowed to object to the granting of a licence without showing adequate proof that he is in a position to supply an equivalent quality. It frequently happens that an application for a certain dyestuff is refused in one case and granted in another at one and the same time. Then if a licence is made out for one ton and, through no fault of the licensee, the goods are shipped in two lots of half a ton each the licence is to be surrendered entirely to clear the first half-ton and a fresh application is to be made and a fee paid for a new licence.

"Clause 2, section 5, of the Act entitles an applicant to object to his case being judged by a member of a licensing committee who may be a trade competitor. All the dye-maker members —of whom there are three—are obviously competitors. The section, moreover, is completely ignored, because the licences are decided mainly not by the committee but by permanent officials.

Endless Inquiries and Delays

"Another cause of unending dissatisfaction is that in contravention of the Act, articles that are not in any sense dyestuffs, but may contain as a minor component part something that by itself might conceivably be used in dye-making, are persistently treated as coming under the Act. Then the complete failure of the officials to grasp the seriousness of delay in trading matters is shown by the questions with which applicants are troubled for weeks, and even months—including requests for samples, the purpose for which the colour is used, and particulars of British colours tried, with reasons and proofs of their unsuitability. Then the customer is referred to other British colours which must be tried and reported on with proofs of unsuitability; and he is even required to give a practical works trial of the colours required made in the presence of the technical adviser. If an application be made on price, the applicant is asked for particulars and proofs of pre-war price, an assurance that no higher figure will be paid than the price given in the application and that it is for the applicant's use only, an estimate of the quantity required over a given period, particulars of quantities used over a previous period, and, among other things, an assurance that the applicant is prepared to pay for the colour on delivery. Of certain standard colours dozens of samples have been supplied to the Committee.

"The Chairman of the Dyestuffs Advisory Committee, Sir Thomas Robinson, has shown a keen desire to investigate every serious complaint provided evidence is furnished. Unfortunately, most of the importers and many of the users are afraid of furnishing evidence which will enable the officials to identify the complainants. They are genuinely and unmistakably in fear of the consequences of it becoming known that they have made complaints. They at least believe that they may be victimised and prejudiced, indirectly if not directly. The very fact that this fear exists is surely in itself one of the most serious charges against the administration of the Act."

Marriage of Miss Muspratt

THE marriage took place on Thursday, November 22, at the church of St. James, Spanish Place, London, of Miss Kitty Muspratt, elder daughter of Sir Max Muspratt, of The Grange, Fulwood Park, Liverpool, and Mr. Howard Raymond Feeny, son of Mr. Howard Feeny, of Mannering Road, Sefton Park, Liverpool. The event was very quiet owing to a recent family bereavement. The Rev. Father Wigg officiated, and the bridegroom was accompanied by Mr. Geoffrey Oulton as best man. The bride, who was given away by her father, was dressed in pale blue georgette, draped with silver lace. The long train was composed entirely of silver lace, and the bridal veil, of Brussels lace, was her mother's wedding veil lent for the occasion. The bride carried a bouquet of lilies of the valley. The bridesmaids were Miss Vauda Muspratt (sister of the bride) and Miss Irmie Feeny (sister of the bridegroom). They wore frocks of white georgette, heavily embroidered in gold, and gold lace veils. They carried bouquets of tiger lilies, the gift of the bridegroom, who also gave them black Parisian bags. The honeymoon is to be passed on the Riviera. The bride travelled in a costume in shades of brown, with handsome furs.

Society of Chemical Industry

Papers before the Nottingham Section

At a meeting of the Nottingham Section of the Society of Chemical Industry held on November 21, Dr. H. S. Holden and Mr. J. E. T. Gilbert read a paper on "Observations on some Micro-organisms Growing in Glycerol." Glycerol was generally considered to have a distinct lethal action on bacteria as seen in the preservation of calf lymph in a sterile condition by addition of an equal volume of 50 per cent. glycerol. This concentration of glycerol was largely used in bacteriological laboratories as a temporary mounting medium, and one such stock solution was found to contain a white flocculent deposit which consisted of one dominant mould (Penicillium type) and several kinds of yeast. Of the latter, two were isolated, one a white variety which formed smooth white colonies on agar, and the other, a pink which showed similar, but larger colony characteristics. The first variety grows well on beerwort agar, and slowly fermented maltose and saccharose, but not lactose. Glucose was fermented rapidly with the formation of acid and gas, while glycerol was fermented with the production of traces of alcohol and formic acid. The most remarkable character of this yeast, however, was its tolerance of high concentrations of glycerol, even up to 75 per cent. solutions. The growth in solutions of lower concentration (5 per cent. to 20 per cent.) was increased considerably by supplying nitrogen either in the form of ammonium sulphate or peptone solutions. Growth in glycerol solutions caused change of form and also definite reduction in size. The pink yeast resembled the white one in its tolerance of glycerol of high concentration, but of the carbohydrates mentioned glucose only was fermented. The effect of the yeast is the production of a general cloudiness in the glycerol, while the flocculent precipitate is a result of infection by moulds. This fungus and the pink yeast are probably the result of contamination from the air, and the production of the white yeast is possibly derived from the glycerol. Two drops of chloroform water (B.P.) to 10 c.c. of the culture solution inhibits the growth of both of the yeasts and the mould. The white yeast has not yet been identified with any known species.

Organic Compounds of Tin

Mr. H. Lambourne read a paper entitled "Organic Compounds of Tin," in which he described the so-called methylstannonic acid $CH_3SnO.OH$, and some new acyl derivatives which seemed to show that they did not correspond to the simple type as represented by $CH_3{\cdot}SnO.OR$. A condensed form of three molecules of the ortho type $CH_3{\cdot}Sn(OH)_3$, would give a cyclic compound $(CH_3{\cdot}SnOOH)_3$, and some of the new derivatives he had prepared corresponded to such polymerised structure in which the tin and oxygen atoms were alternately combined. Other compounds appeared to be of open chain structure, still containing the tin and oxygen atoms in alternate combination, while just recently he had obtained derivatives of even more complex constitution, possibly of the type $(CH_3SnOOR)_6$.

A Universal Regulator of Acidity

Dr. Prideaux then gave a demonstration of a universal regulator of acidity, with some suggested uses in analyses, and showed the advantages of using the symbol P_H in quantitative and graphical treatment of acidity and alkalinity. The lecturer showed how rapid changes of P_H with added alkali corresponded to good titrations, while buffer mixtures produced gradual changes which corresponded to good hydrion regulations. He showed how the "B.D.H." Universal Buffer Mixture, together with their universal indicator, improved the regulation by the introduction of acids of intermediate dissociation constants, and indicated how the P_H values of milk and other fluids could be tested.

It could be shown that the P_H of beer lies between 3·9 and 4·7 by adding pure litmus to one sample which should give a red colour, and to another sample bromphenol blue which should give violet. The exact P_H of beer could then be determined by using the universal buffer with methyl red. The use of the "B.D.H." comparator case was demonstrated as improving the accuracy of the determination. In hopped worts, prevention of the growth of disease was obtained if the P_H was below 5·4, and this value could be as low as 4·3 without inhibition of yeast growth. The P_H of vinegar is given by different authorities as 2·36 to 3·21 and 2·67 to 2·84 respectively, and it should not be below the lowest of these values. Buffer solution and tropaolin o.o. showed a sample of vinegar after five-fold dilution to have a P_H of 2·8.

A discussion followed in which Mr. Burford asked as to what was the advantage in taking the P_H of ordinary drinking water; Mr. Calam inquired as to the sensibility of the palate towards liquors of low acidity, and mentioned the very different taste of beer and vinegar, although of similar P_H values.

In reply, Dr. Prideaux stated that the P_H determination was useful in conjunction with other chemical properties of water. As yet no sensitiveness of the palate to P_H had been found, but probably 0·001 N was about the limit, but considerable variation occurred according to whether the P_H was produced by a strong acid in low concentration or a weak acid in higher concentration.

The Russian Dyestuffs Industry

Developments Since the Revolution

According to the Green Book of Russia's trade returns, a new Dyestuffs Trust is slowly arising amongst the Soviets. This is the Anil Zevod or Aniline Dye Trust, which embraces all the aniline dye works of Soviet Russia. The Trust includes nine different organisations in Moscow and also the factory at Dorogomilov which used to belong to the Russian Chemical Society. All the works, save one, are at present working. Two only of the ten produced dyes before 1914 and these they made out of intermediates imported from Germany.

The problem before the Trust was thus not merely the rebuilding of the Russian dyestuffs industry as it existed before the war, but the much more difficult task of making the essential intermediates which had hitherto been imported. The new products already on the market include benzidine, alpha-naphthylamine, ortho- and para-toluidine, para-nitraniline, meta-phenylenediamine, H. acid, saccharine, acetic anhydride, crystal violet, antiphebrin, and silver-salvarsan. The production of these organic products has facilitated the making of a number of organic dyes. The difficulties in the way have been very great. All, or nearly all, the chemical laboratories had to be rebuilt under difficult conditions, and with an extreme shortage of necessary material. The Kinishem Works are now, after a long delay, again producing sulphuric acid; the Olgin Works, oleum and chlor-sulphonic acid, as well as bisulphate. The question of supply for the Aniline Dye industry is, declares the Report, being solved satisfactorily. The necessary product for the fundamental chemical industry is being supplied by Russia's chemical factories, with the exception of saltpetre which has to be obtained from abroad. With regard to benzol and other coal tar products, so far the supplies obtained previously have sufficed. The Don coal basin is now beginning to supply coke benzol which will satisfy the demand of the combine for benzol, naphthalene, and so on. Of phenol there is still a fair supply, and it can also be produced by the Trust. Zinc dust was formerly received from abroad, and will probably have to be obtained again in a similar manner. As stated, the further development of the aniline dye industry depends mainly on the supply of intermediate products. A great deal in that respect has already been done by the Trust, but a free supply from abroad would considerably widen the scope of activity, and would enable the Trust to make the various colours required by the market.

In view of the huge demand for dyes, the disposal of the products is assured, and no fear of a crisis, the Report asserts, need be entertained. On the very lowest calculation the market demand is about one hundred and fifty-six tons a month. Notwithstanding high duties, about thirty-one tons were imported legally over a period of six months, and a great deal by contraband. The financial position of the combine is satisfactory, particularly when compared with other branches of industry. The absence of credit under the present system in Russia has severely handicapped the Trust at various stages. Unfavourable factors for the development of the industry are the excise duties of the Government on salt used in great quantities and on spirits used as a solvent in many processes.

Reviews

ORGANIC CHEMISTRY FOR ADVANCED STUDENTS. By J. B. COHEN, Ph.D., B.Sc., F.R.S. Fourth Edition. Part I.—Reactions, pp. 423. Part II.—Structure, pp. 461. London: E. Arnold and Co., 1923. Price, 18s. each.

The appearance of the fourth edition of Prof. Cohen's fascinating book will be welcomed by all those whose interest in organic chemistry did not cease with the taking of Inter. Science or Pass B.Sc. Parts I and II (Reactions and Structure) are now issued, and Part III (Synthesis) is promised for the end of November.

The advances in organic chemistry during the last five years have made necessary several important additions since the second edition appeared in 1918 (the third edition, 1920, differed from the second only by a score of pages in the three volumes). Part I has been increased by 57 pages, Part II by 26 pages, and further space has been found for new matter by cutting out certain less essential portions of the old. The new views of valency and chemical reaction developed by Briggs, Fry, Lewis, Langmuir, Lapworth and Robinson are accorded the full treatment they merit, the account given being exceptionally clear. Three new pages are devoted to modern theories of catalysis, and amongst much other recent work included may be mentioned the investigations of Hollemann, Vorländer, Lapworth and Kenner on substitution and displacement of groups in the benzene nucleus, of Baly and Heilbron on photosynthesis, of Jacobson on the semidine and benzidine transformations, of Senter and Drew on the Walden inversion, of Sir W. Bragg on crystalline structure of organic compounds, and the numerous and varied researches of Ingold and Thorpe. The section on Condensation has been considerably enlarged and in part rewritten. It would be improved by the addition on page 194 of a summary of the headings under which the reactions are classified. The chapter on Chemical Dynamics has been revised and rearranged with distinct advantage and now includes sections on photochemical reactions and the influence of temperature upon reaction velocity.

As may be expected in a fourth edition, typographical errors are comparatively rare, though by no means absent. Amongst others we notice "indole" for "pyrrole" (II, 396), a redundant "which" (II, 128), uncorrected page headings (II, 129, 137), a missing bond in the fourth formula on page 313 (Part I), and "148" for "239" (I, 158). We should prefer a less Germanic nomenclature for "azimidobenzene" (I, 311), "diazobenzolimide" (I, 311, 314) and "coumalinic acid" (I, 319, 320). On page 148 (Part I) "hydrogen" in line 5 should read "nitrogen" or perhaps "oxygen." The section on ketenes has been brought up to date, but it is difficult to see why the paragraphs on ketimines and ketimides should have been added. They are not related to ketenes and the irrelevancy is unfortunately made confusing to the student by a misprint of $(C_6H_5)_2C:O$ for diphenylketene, $(C_6H_5)_2C:CO$, on the previous page. In the discussion of conjugated linkages no answer is given either in Thiele's or any other theory to the question raised on page 147 (Part I)—why *does* reduction, etc., stop after 1:4 addition has taken place?

We notice two avoidable duplications: the action of formaldehyde on phthalimide is quoted in error on page 238 (Part I) as well as in its proper place (page 300), and Langmuir's views on catalysis of gas reactions by solids are given fully both on page 179 and on page 382 in Part I.

These are, of course, small matters and do not affect the value of a book which is unquestionably the standard work of its type. The selection of subjects leaves little to be desired, though one rather grudges some of the space devoted to thermochemistry, the benzene problem, and in lesser degree to chemical dynamics.

We have referred to the book as "fascinating," and several of the dozen long chapters which constitute the two volumes under review arouse something of the same enthusiasm we felt when we first read Lachmann's "Spirit of Organic Chemistry"—now, alas, long out of date and out of print. Prof. Cohen intrudes himself perhaps too little on the reader, though here and there he gives his own decision on a contested point. The presentation of the various problems is well calculated to provoke ideas for research.

The book is excellently printed and bound and the price is reasonable. The insertion of new matter without undue disturbance has usually been successful, but some pages have suffered considerably (*e.g.*, I, 72, 73, 349; II, 364, 370, 376), and the small-print addition on page 229 (Part I), which appeared in the 1918 edition, has not yet attained to the dignity of long primer.

CECIL HOLLINS.

MANIPULATIONS DE CHIMIE COLLOIDALE. Par WO. OSTWALD, Professeur a l'Université de Leipzig, en collaboration avec P. WOLSKI et A. KUHN, traduit par EDMOND VELLINGER. Gauthier-Villars et Cie, Paris, 1923. Pp. 201. Frcs. 10.

This treatise is a French translation of the fourth German edition of a volume which has proved extremely popular. The name of the chief author alone is sufficient to make one anticipate an excellent book, and doubtless such it is. It gives a very brief account of many modern practical methods for the preparation of colloidal solutions, their investigation and separation of components. The theoretical basis and conclusions are dealt with in great detail. The description of complicated apparatus has been omitted. From this one should not assume that the little volume is elementary; far from it. However, it contains so many experiments which can easily be performed by anyone that it makes colloid chemistry a really pleasant subject. The preparation of emulsions might have been included to advantage; also a little more might have been said about the mechanical methods for the preparation of colloidal dispersions, which are dismissed in a few lines, as these methods promise to be of paramount importance in the future of practical colloid chemistry. The researches of Wegelin and Von Weimarn have shown that almost any substance can be dispersed by mechanical means, and the extension of these ideas to industrial machinery has been described in the pages of this journal. The book possesses a fascination of its own. There is an abundance of ideas dealt with so succinctly as to act in a very stimulating manner. It is a pity that so far this volume has not found an English translator, for undoubtedly it is one of the best works on the subject. It is well edited and printed, and written in such a simple and lucid style that it should make easy reading even to the chemist whose knowledge of French has become a bit rusty. In short, it should be in the possession of everyone interested in colloid chemistry.

S. P. S.

VAN NOSTRAND'S CHEMICAL ANNUAL. Edited by Dr. JOHN C. OLSEN. Fifth Issue, 1922. London: Constable and Co., Ltd. Pp. 900. 21s. net.

This book consists of a very valuable collection of tabular matter of various kinds relating to chemical science, and it has been compiled by a number of authorities in the United States under the general editorship of Dr. Olsen, the secretary of the American Institute of Chemical Engineers. In addition to the usual miscellaneous tables dealing with atomic weights, molecular weights, logarithms, etc., there are special tables of factors for use in volumetric analysis of various kinds, specific gravity tables of a large number of solutions and liquids, alcohol tables by the U.S. Bureau of Standards, vapour tensions of various liquids, and finally a useful list of new books published in various languages since 1917. The whole book has been carefully revised, through various editions, and should prove an accurate and valuable compendium.

PERFUMES AND COSMETICS. By WILLIAM A. POUCHER, Ph.C. London: Chapman and Hall. Pp. 462. 21s. net.

This book is divided into three parts, the first being a dictionary of the more important raw materials and miscellaneous bodies, including pigments and dyes, used by the chemist-perfumer. The second and third parts deal with perfumes and cosmetics respectively. Concise accounts are given of the extraction and preparation of various kinds of perfumes and toilet waters, special reference being made to synthetics. The section on cosmetics appears very comprehensive and a number of recipes are included. There are numerous illustrations of the natural perfume industry, and the book is exceedingly well printed and makes interesting reading, while the author, being the works manager of the United Chemists' Association, Ltd., at Cheltenham, is well qualified to deal with the subject.

X-Ray Analysis of Metals

Address by Sir William Bragg

SIR WILLIAM BRAGG, addressing the Birmingham Metallurgical Society on Thursday, November 22, on "The X-ray Analysis of Metals" said that students of metallurgy were well aware that the properties of the metals and other bodies depended very greatly on the nature of their crystallisation. The microscope had rendered most valuable service to their work, largely because it enabled them to study the form and arrangement of the crystalline grains in the material under investigation. The X-ray methods carried the same form of inquiry into a region ten thousand times more minute, and furnished new evidence as to the crystalline nature. They did that in various ways. Every crystal had its characteristic X-ray spectrum, and could be identified thereby even when the individual crystals were beyond the resolving power of the microscope and the substance was in danger of being called amorphous. If a specimen contained a mixture of crystalline substances, the spectrum showed the added effects of all the substances, and provided each individual spectrum was known the specimen could be analysed. The analysis differed from a chemical analysis in that the latter first pulled the specimen to pieces and then determined the elements that were present and their relative proportions, while the X-ray analysis left the structures intact and determined what crystals were contained in it: or, in other words, the nature of the combinations which the atoms had formed. It did not, however, give accurate information as to the relative proportions of the crystals.

The problems of the crystallisation of metals, proceeded Sir William, really presented no more difficulty than others, but appeared more difficult because difficult questions were asked in respect to a subject of practical importance. Some very useful work had already been done. The crystalline form of each metal was comparatively easy to find, but the more interesting questions related to the structure of alloys and to the problems of stress. Westgren and others had examined the various forms of iron, and had given good reason for supposing that the carbon atoms were thrust into the interstices of the regular lattice in which the iron atoms were arranged. Owen and Preston, working in conjunction with Rosenhain, had shown that in a copper aluminium alloy, as well as other alloys of two metals, the one metal might replace the other in the structure. Rosenhain had based a theory of hardening on their results. The apparatus required for this work had been reduced very largely in complexity and cost as the result of work for which the Department of Scientific and Industrial Research supplied the necessary funds.

Alsace-Lorraine Trading Company's Affairs

THE statutory first meeting of creditors in the voluntary winding-up of the Alsace-Lorraine Development and Trading Co., Ltd. (Societe Generale D'Alsace Lorraine) was held on November 23.

The liquidator (Mr. A. H. Partridge) stated that the meeting was really a sequel to a conference of some of the larger creditors which was held on June 19 last, when the position of the company was explained. A scheme was decided upon at that meeting to the effect that certain of the assets should be realised, and that the remainder be kept by the company for the purpose of carrying on the business. It was also resolved that all the creditors under £20 should be paid in full, while a committee of three was appointed. Unfortunately, that scheme had fallen through, and the hope that the company would, in time, be able to pay its debts in full had not materialised. The committee therefore decided that the best thing the company could do in the circumstances would be to go into voluntary liquidation. The reasons of the present position were that the bank took the company's resources to pay the debt to them; two shipping companies seized goods as security; and certain of the creditors in Alsace had commenced proceedings in respect of compensation alleged to be due for concellation of contract. The liquidator presented a statement of affairs which showed liabilities of £12,743 (£9,642 due to unsecured creditors), and assets set out as £8,969, a deficiency of £3,774.

After some discussion it was decided to confirm the voluntary liquidation of the company with Mr. Partridge as liquidator and a committee of five of the principal creditors.

The Question of Petroleum Supplies

Research on Hydrocarbons Urged

THE Commercial Motor Users' Association and the London and Provincial Omnibus Owners' Association, acting in conjunction with the Society of Motor Manufacturers and Traders, held a road traffic conference at Olympia on Tuesday in connection with the Commercial Motor Transport and Roads Development Exhibition. Mr. E. S. Shrapnell-Smith (president of the Commercial Motor Users' Association) presided.

Admiral Sir Edmond J. W. Slade (vice-chairman, Anglo-Persian Oil Company, Limited) read a paper on "Fuel Resources and Supplies for Road Transport." It was absolutely essential, he said, for the progress of our national life that in no circumstances should our transport, in any of its numerous phases, be interrupted. At present the position was that we were absolutely dependent on adequate supplies of petroleum. There was no prospect that these would not be forthcoming under normal circumstances, but the control was not in our hands. The wells from which the petroleum came lay for the most part in foreign countries, and in a very large measure the control of this supply was also in foreign hands. At the same time it was known that under certain conditions solid hydrocarbons, of which we possessed an ample supply, could be broken up and would yield products which could be used in internal combustion engines, but so far this had not proved a commercial success.

In view of the extreme importance of securing the supply of adequate quantities of suitable liquid fuel for transport purposes, he suggested that a national policy was clearly indicated—viz., to consolidate such control as they possessed over existing oilfields, and to push forward research work to perfect the processes by which our ample store of solid hydrocarbons could be converted economically into the all-essential liquid form.

Dr. W. R. Ormandy, who opened the discussion, said that while our demands were being met more and more by Persia, the supply had to be brought oversea, and was thus open to destruction by submarine in case of war. The problem of converting solid coal into liquid fuel was of the greatest importance for the safety of the country. At present some £800,000 had been spent in trying to solve the problem, and it was of national necessity that further experiments in that direction should not be neglected.

The discussion was continued by Mr. Thomas Clarkson (vice-president, Institution of Automobile Engineers), Rear-Admiral Philip W. Dumas, Major-General S. S. Long (chairman, Traffic Committee, Federation of British Industries); Mr. J. S. Critchley (past-president, Institution of Automobile Engineers); Mr. E. W. L. Nichol (fuel expert to the London Coke Committee); and the Chairman, who joined in the view that a national fuel policy should be pursued in this country, and that the supplies of fuel should be kept in British-owned lands.

Affairs of Fine Chemicals, Ltd.

THE affairs of Fine Chemicals, Ltd., came before the Irish Chancery Court at Dublin on Monday, November 19, and Mr. Justice Pim gave leave to the liquidator to call the creditors together. In an affidavit, the liquidator, Mr. Walter Conan, stated that as far as he could ascertain the company was wholly insolvent, and it would not be possible to pay the creditors more than about 5s. in the £. The total liabilities came to about £27,000, of which £14,000 was partly secured, and the assets would not realise more than £13,000. From his investigation of the books, it seemed to him perfectly clear that the company was managed and its records and accounts kept in a fashion which was not only lax and careless, but showed a complete disregard of many of the regulations provided by the Companies Acts and the ordinary principles of accountancy. The company appeared to have been in difficulties for some time, and in February, 1922, efforts were made to secure further capital for the business, and proposals were made by a group comprising some of the directors and shareholders to introduce £5,000 additional capital on the terms of a re-arrangement of the capital. A prospectus had recently been issued in America containing a number of statements which were untrue, and he (the liquidator) had been advised that he could not safely deal with the assets of the company without making some provision for the possible claims from America, except under the direction of the Court.

British Casein Company, (1911), Ltd.

In this compulsory liquidation the Official Receiver has now issued to the creditors and to the shareholders a summary of the company's statement of affairs showing liabilities £1,877 (ranking £1,689), estimated assets £817 net, and a total deficiency of £2,873 with regard to the shareholders.

In his report, the Official Receiver observes that the company was a reconstruction of the British Casein Company, Ltd., registered in 1907. The company was chiefly engaged in placing casein and milk products on the market. The business at first proved profitable, and until 1917 dividends were declared, but by the year 1918 the payments to the directors by way of salary and remuneration had become very heavy in comparison with the net results of the trade. On December 10, 1918, when Pyttersen resigned from the board, it was resolved that N. A. C. Ouwehand, as sole director, should be responsible for the conduct of the business and for due payment by the company of any debts contracted. Ouwehand acquired Pyttersen's shareholding in the company for cash and also a further 190 shares held by other shareholders. In August, 1920, the shares of dissentient shareholders were transferred to Mrs. Ouwehand, and with the exception of seven shares the whole of the issued capital was now held by Ouwehand and his wife. In addition to remuneration and expenses in 1920 (£1,584), Ouwehand had drawn sums amounting to £1,400, and, with a further amount outstanding on loan account, he was shown in the books as a debtor for £1,508. The books of account ceased to be properly kept, and Ouwehand conducted the business and affairs of the company without regard to his duties as a director. Ouwehand stated that he was unsuccessful in his efforts to obtain the assistance of another director, and that the business gradually decreased owing to lack of working capital. The failure and insolvency of the company was attributable to lack of working capital, which restricted the company's operations in buying and selling casein, and to the comparatively heavy amounts drawn by Ouwehand for remuneration and expenses. Ouwehand had verified the statement of affairs by affidavit with the following reservations:—(*a*) That he acted on the advice of his solicitors and accountants (and not on his own initiative) in borrowing money from the company to buy out shareholders, and he does not recognise the balance of loan (£917) as a personal liability. (*b*) That the figure of directors' fees shown in the deficiency account at £2,476 is erroneous owing to faulty book-keeping. The correct amount, he states, is £1,000.

The liquidation remains in the hands of the Official Receiver.

The Sale of a Patent Fish Oil Process

In the King's Bench Division, the Lord Chief Justice and a special jury heard an action by Mr. Edmund Gifford Oliver, of 59, Cadogan Square, W., against Mr. James Wolstenholme, of 85, London Wall, E.C., in which plaintiff claimed the return of £1,000 he had paid defendant in return for a one-third share of the price received for the sale of a process for the manufacture of edible fats from fish oils. Mr. Oliver's case was that Mr. Wolstenholme told him that he had an option of the purchase of a valuable process from the Lewkowitsch Laboratories, and that he was putting up his own money to develop the matter in connection with a process he controlled, that it might be sold at a good profit. It was ascertained a long time after plaintiff paid over his money that Mr. Wolstenholme had never controlled the process, and plaintiff charged him with misrepresentation, and claimed his money back for want of consideration.

The defence was that plaintiff put up his money that he might get a share of the profits from the sale of the process should defendant be able to dispose of it. The price of the process demanded by the Lewkowitsch Laboratories was £45,000.—Mr. Oliver told the Court that he did not know the price of the process until long after he paid his money, and then he gathered it from a letter that defendant wrote about the option to Messrs. Spencers, Ltd., of Aberdeen. Plaintiff said he was told that Mr. G. H. Worburton, who was perfecting the process, had become ill and could not go on, and had the process been a success it would have been a great financial achievement. He denied that defendant showed him the option.

Mr. Wolstenholme, in his evidence, said he held an option on that process for some months, and showed it to Mr. Oliver. He negotiated with Messrs. Spencers, Messrs. Levers, and other big firms for the sale of the process without success. Mr. Oliver never grumbled then about the loss, but said he would make it back upon his palm oil speculation.

The jury stopped the case, and returned a verdict for the defendant, for whom judgment was entered, with costs.

Chemical Manufacturer's Examination

In the Manchester Bankruptcy Court on Friday, November 23, the public examination was conducted of Bertram Levin, described as a chemical manufacturer, carrying on business at 86, Deansgate, Manchester. In his statement the debtor estimated that he had lost in shares £14,280, and in bad debts something like £11,400. His household expenses amounted to £2,000 a year, and he stated that these various sums accounted for the disappearance of most of the surplus of £36,405 which he had in July, 1921. According to his financial statement, the debtor still had a surplus of £912. He did not admit insolvency, but stated that he had got into difficulties through having an action against Victors, Ltd., Manchester, one of several companies in which he had large financial interests. On behalf of a petitioning creditor an order of the Court was asked for to compel the debtor to prepare a trading account. Mr. Registrar Atkinson said the accounts of the debtor were in a hopeless condition, and he had never seen a clumsier statement for an educated business man. He decided to adjourn the proceedings in order to enable the debtor to prepare more complete accounts.

Transport of Zinc Ashes

In the Court of Appeal, on November 19, the case of Brandt and others *v* Liverpool, Brazil and River Plate Steam Navigation Co., Ltd. was heard.

In the original case, Mr. Justice Greer gave judgment for the plaintiffs, A. H. Brandt and Co., for the return of the money they had paid under protest, £748, and damages for failing to carry the goods on board the *Bernini* and deliver them in due course on the arrival of the vessel in Liverpool, such damages to be assessed. (The Chemical Age, May 12, 1923, p. 513.) His Lordship also gave judgment for the same plaintiffs on the counterclaim, and dismissed the claim of Vogel and Co. with costs. From this result the defendants now appealed.

The main question in the case was whether Brandt and Co. were entitled to sue the shipowners, and at the conclusion of the arguments their Lordships decided this and other points in favour of Brandt and Co., and dismissed the appeal with costs.

Drug Merchant's Bankruptcy

A sitting for the public examination of Mr. Robert M. Lambert, drug merchant, 10, Great St. Helens, E.C., was appointed at the London Bankruptcy Court on Friday, November 23. A statement of affairs was filed showing that the debtor's liabilities were returned at £9,605, of which £4,896 were expected to rank, and that his assets consisted of book debts of the face value of £2,044, but estimated to be bad. The Official Receiver said that the statement as lodged required amendment, and he was consequently not yet in a position to proceed with the examination. The Registrar ordered an adjournment until January 18.

Sulphate of Ammonia Action

The action by the British Sulphate of Ammonia Federation. Ltd., against the South Metropolitan Gas Company, relating to the proper method of keeping accounts in a pooling system and price equalisation system, adopted as a consequence of the war, was not, as arranged, mentioned to Mr. Justice Greer in the King's Bench Division on Wednesday. Sir John Simon, K.C., and Mr. Wright, K.C., who are leaders in the case, are engaged in election work, and the case is probably awaiting their return.

From Week to Week

SIR J. J. THOMSON received an honorary Doctorate from the Sorbonne on Saturday, November 24.

PROFESSOR HERMANN PLAUSON, the inventor of the Plauson colloid mill and the ultra-filter, is at present staying in London on a visit.

THE DEATH TOOK PLACE on Thursday, November 22, of Mr. R. H. Whitfield, of Saltley. He was a partner in the Birmingham Welding Co.

AT MANCHESTER UNIVERSITY, Mrs. Gertrude Robinson has been awarded an honorary research fellowship in chemistry and Mr. W. K. Slater in chemical physiology.

ARRANGEMENTS HAVE BEEN made for broadcasting the speeches by Lord Haldane and others at the annual dinner of the Institute of Chemistry in London on December 10.

PROFESSOR GILCHRIST addressed a meeting of the Newcastle and District Horticultural Mutual Improvement Society on Tuesday. He said that by using too many potash manures gardeners considerably reduced their profits.

IN ADDITION TO the candidates mentioned last week, Sir J. Brunner (L.) is contesting Southport; Mr. H. Mond (L.), son of Sir Alfred Mond, is standing for the Isle of Ely; and Dr. J. F. Crowley, engineer, a partner of the late Dr. Harker, is the Liberal candidate for Warrington.

AN EXPLOSION, resulting in the loss of twenty lives, took place on the British steamer *Otterburn*, at Marseilles on Friday, November 23. The vessel was bound for Barcelona and New York, with a cargo of cotton goods, chlorates, and benzene, and it is believed that the explosion was caused by stowaways throwing down lighted matches or cigarettes.

DR. L. L. LLOYD, of Bradford, addressing the members of the Yorkshire section of the Society of Chemical Industry at Leeds, dealt with the preparation of fibres for the purpose chiefly of decoration. He showed how quite recently sulphuric acid had been successfuly used instead of caustic soda for the purpose of mercerisation with very good effect, and it had the advantage over the effect produced by caustic soda that it was absolutely permanent and was not affected by washing.

THE COKE SUPPLY to Midland blast furnaces has been the subject of a conference this week between suppliers and smelters. For a long time past it has been urged that the recovery of the iron and steel trade was being retarded by the high cost of fuel, this being in some cases nearly double the pre-war price. At the end of September the price was reduced from 26s. to 24s., and it was decided at the conference that these terms should remain in force for the ensuing four months.

PRINCIPAL SUMPNER, speaking at the annual prize distribution to the students of the Birmingham Municipal Technical School on Thursday, November 22, stated that the chief events of the year had been the provision of a new research laboratory for chemistry, another for metallurgy, a plumbing shop, a bakery, and the purchase of machinery from the Disposals Board for the engineering department. The research laboratory for chemistry was due to the gift of £425 from various firms.

THE MANCHESTER COTTON MERCHANTS AND DYERS, after a dispute lasting two months, made fresh proposals, which were accepted on Wednesday by the Shipping Merchants' Committee of the Manchester Chamber of Commerce. The proposals provide for a discount on a sliding scale, to be allowed by the Piece Dyers' Association according to the amount of business placed with members of the Association. In addition, there is to be an immediate reduction in charges of 7½ per cent.

THE DORLAND AGENCY, LTD., 16, Regent Street, London, S.W.1, and at New York, Paris, Buenos Aires and Rio de Janeiro, have been appointed by the British Empire Exhibition as sole agents for all Overseas advertising. It is requested that all representations in respect to such advertising be made through them. British manufacturers or exhibitors at the Exhibition, who wish to have their advertising in the Overseas Press associated with the announcements of the British Empire Exhibition should communicate with the Dorland Agency, Ltd.

THE PAPERS presented at the meeting of the Faraday Society in London on Monday included the following:—"Concentration Cells and Electrolysis of Sodium Ethoxide Solutions," by Dr. Masuzo Shileata (Kyoto); "Oxidation and Reduction Potentials of Organic Compounds," by Mr. Einar Bülmann; "Processes at the Mercury Dropping Cathode," by Dr. Jaroslao Heyrovsky; "The Mechanism of the Reversible Electrode," by Dr. E. H. Rideal, and "Determination of the Affinity Constants of Bases by the Hydrogen and Quinhydrone Electrodes," by Dr. J. N. Pring.

MANLOVE, ALLIOTT AND CO., engineers, Nottingham, describe in their postal circular various types of machines used in the laundry industry, including washing machines, hydro extractors, and patent ironers. In their note headed "Protect Home Industries," they state "There are various opinions as to the desirability or otherwise of altering the fiscal system with the object of protecting home industries, but there can be no difference of opinion as to the need for supporting home industry by buying British goods whenever possible, providing price and quality are right."

AN EXPLOSION took place at the chemical works of G. J. Webb and Co., Middlestone, County Durham, on Wednesday, November 21, as a result of which two men lost their lives. The men were working in a detonator house, and it was part of their work to put fulminate into detonators. At the inquest the works manager stated that the men were not allowed to have more than 2 lbs. of explosive in the compartment at a time, but possibly in this case 4 lbs. had been present. He thought the explosion had its origin in the filling machine. A verdict of accidental death was returned.

BRIGADIER-GENERAL F. C. STANLEY, chairman of the Associated Portland Cement Manufacturers, Ltd., who has just returned from a visit of inspection of the company's cement works in British Columbia and Mexico, contradicts certain statements which have appeared in the Press in reference to the alleged passing of control from his board to the Associated Anglo-Atlantic Corporation. He adds that the references to American control or management are entirely untrue, and that he has the authority of the chairman and board of the Associated Anglo-Atlantic Corporation to state that their company is an entirely British corporation.

AT A CONFERENCE of the Association of Sewage Works' Managers held at the Agricul ural Hall, London, on Thursday, November 22, in connection with the Public Works, Roads and Transport Exhibition, it was announced that a special committee has been formed to formulate standard sewage tests, it being generally felt that much has been learned since the Royal Commission test was instituted. The special committee is endeavouring to gather in all the information it can with the object of getting the Ministry of Health to call a conference of all interested parties, the Institute of Chemistry and the Society of Public Analysts being named in this connection. The idea, of course, is to be something in the nature of a round table conference. A standard test, or a limited number of standard tests, will be formulated, so that the results of analyses of sewage effluents in all parts of the country will be capable of comparison.

THE ANNUAL DINNER of the Manchester Section of the Society of Chemical Industry was held on Friday, November 23. The guests included the Mayor of Salford (Alderman J. P. McDougall); Dr. E. Frankland Armstrong, President of the Society of Chemical Industry; Dr. H. Levinstein, Chairman of the Section; Professor H. B. Dixon; Mr. S. J. Pentecost, President of the Society of Dyers and Colourists; Dr. E. Ardern, Vice-chairman of the Manchester Section; Alderman F. J. West, Chairman of the Manchester Corporation Rivers Committee; Professor F. L. Pyman, Mr. J. Huebner, Mr. L. Guy Radcliffe, and others. The Mayor of Salford proposed the toast of "The Society of Chemical Industry and the Manchester Section," which was responded to by Dr. Armstrong and Dr. Levinstein. Dr. Levinstein proposed the toast of the "Allied Societies," coupled with the names of Professor H. B. Dixon and Mr. S. J. Pentecost. Dr. E. Ardern proposed the toast of "The Guests," coupled with the name of Alderman F. J. West. Alderman West, in acknowledging the toast, referred to the increasing closeness of relationship between the present-day chemist and engineer. Both professions realised that it was absolutely necessary for each side to understand the point of view of the other if there was to be adequate co-ordination of effort and resultant perfection of output.

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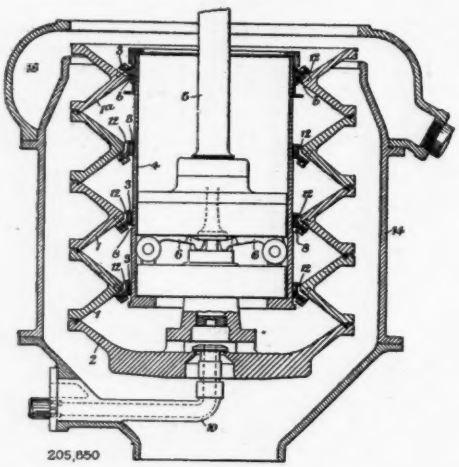
Abstracts of Complete Specifications

205,850. Centrifugal Separators and the Like. W. Mauss, 72, Cullinan Buildings, Simmonds Street, Johannesburg, South Africa. Application date, June 26, 1922.

This separator is of the kind described in Specification No. 164,418 (See The Chemical Age, Vol. V., p. 75) in which the drum consists of a series of axially spaced separating chambers having conical walls which form peaks between the chambers. The drum is composed of a series of separate rings 1, and a fixed bottom ring 2. The rings carry annular members 3, which are slidable on a cylinder 4, which itself is slidable by means of toggle mechanism 6 relatively to the driving shaft 5. The uppermost ring 1*a* is rigidly secured to the cylinder 4. The thickness of the cylinder varies for each ring, thus providing shoulders 8, which engage with the annular rings 3 when the cylinder is lifted so that the rings 1



205,850

are separated at their peripheries. The material to be separated is admitted though the pipe 10, and the rings 3 are attached to the rings 1 on the sides of the peaks nearest to the inlet. Passages 12 are left through which the lighter material passes so that this material is retained within the radial limits of the rings 3. The overflow peak *b* of the ring 1*a* is closer to the cylinder 4 to cause a slower flow over the lower peaks. The lighter material is finally discharged into the annular outlet 16, and the heavier material is discharged into the receiver 14, by lifting the cylinder 4 so as to separate the various sections 1 at their peripheries.

205,868. Cracked Hydrocarbon Spirit, Purification of. F. G. P. Remfry, Meadhurst, Cadbury Road, Sunbury-on-Thames. Application date, July 22, 1922.

Cracked hydrocarbon spirit is vaporised and passed over active cocoanut shell charcoal heated to 100°—250°C., by which the unsaturated hydrocarbons are condensed or polymerised. The vapour may be passed direct from the cracking tube through the active charcoal without previous condensation, or it may be passed first into a dephlegmator which condenses the fractions boiling above 200° C., while the uncondensed vapour is passed through the active charcoal at about 220° C. In an alternative, the whole of the cracked vapour may be condensed and then fractionally distilled. The lighter portion boiling below 200° C. is collected and vaporised, and the vapour is passed through the activated charcoal at a temperature of 10°—20° C. above the final boiling point of the liquid. The active charcoal may be in broken granular condition, and packed in steel tubes through which the vapour is passed. The tubes may be periodically cut out of the vapour circuit and the charcoal reactivated. Free hydrogen, or a gas containing it, may be added to the vapour under treatment and the treatment may be effected under pressure.

205,898. Viscose, Manufacture of. H. Dreyfus, 8, Waterloo Place, London, S.W.1. Application date, July 27, 1922.

Specification No. 183,882 (See The Chemical Age, Vol, VII., p. 354) describes the manufacture of a high molecular viscose (cellulose xanthogenate) in which one molecule of carbon disulphide is combined with several molecules of cellulose, the usual ripening of the viscose being dispensed with. The xanthogenation may be carried out in an organic solvent, such as benzol, or other organic liquid which dissolves or mixes with the carbon disulphide. This ensures the thorough distribution of the carbon disulphide in the alkali cellulose and prevents local action and oxidation, so that the temperature may be kept down. It is now found that any other process for the manufacture of viscose may be carried out with advantage in the presence of benzol. The reaction may be effected at a reduced temperature, which may be obtained by water or brine circulation. In carrying out the process according to one example, cellulose is kneaded with caustic soda lye containing 15—18 per cent. of caustic soda and liquid is then removed until the material contains three to four times its weight of solution. The alkali cellulose is then transferred to a mixture of carbon disulphide and benzol, and allowed to stand until a sample of the xanthogenate possesses the required solubility in water or alkali, after which the benzol is removed. Instead of producing the alkali cellulose in the usual way, the cellulose or its conversion product may be treated with metallic compounds or metals, such as oxide of sodium, potassium, calcium, or magnesium, hydride of calcium or magnesium, alkali metals or alkaline earth metals, sodamide, dry sodium ethylate, or the like. These agents are capable of binding water chemically and enabling the alkali or base to become more intimately combined with the cellulose. The compound thus formed by the water and the added reagent serves to unite with the cellulose or conversion product, to form the alkali cellulose. The cellulose may be impregnated with strong caustic alkali solution, and then added to the benzol, and mixed with sufficient calcium oxide to remove the water. The mixture may be strongly cooled during this operation.

205,955. Alkali Salts, Process for the Manufacture of. Plauson's (Parent Co.), Ltd., 17, Waterloo Place, Pall Mall, London, S.W.1. From H. Plauson, 26, Jarrestrasse, Hamburg, Germany. Application date, September 13, 1922.

When alkali sulphate is electrolysed, sulphuric acid is produced, which may be caused to react with an insoluble salt, such as a carbonate or sulphite, capable of liberating a gas; the gas thus obtained may be used for neutralising the alkali set free at the cathode. In the present invention this process is simplified by placing the anode vertically below the cathode, so that the liberated gas passes upwards through the cathode liquor. Fresh solution may be introduced continuously through the anode, and the resulting solution withdrawn continuously through the cathode, porous electrodes being used. In an example, a solution of sodium sulphate is electrolysed, using an anode of carbon, coke, graphite or the like, which is placed in the bottom of the vessel and covered with a layer of calcium carbonate, barium carbonate, or lead carbonate. A porous cathode of iron is placed above the anode, and the liquid is electrolysed by a current of 1–3 amperes at 2·6–3·6 volts. When all the calcium cabonate is converted into calcium sulphate it may be dried and burned. In a modification, a suspension of barium carbonate in barium sulphate is passed continuously through the anode, and sodium carbonate withdrawn through the cathode together with barium sulphate which is filtered off. The sodium carbonate thus obtained contains free alkali.

205,984–5. Preparation of Ores and Other Metallurgical Products for Leaching Process. C. Hennes, Treskow Allee 92A, Karlshorst, Berlin, Germany. Application date, October 10, 1922.

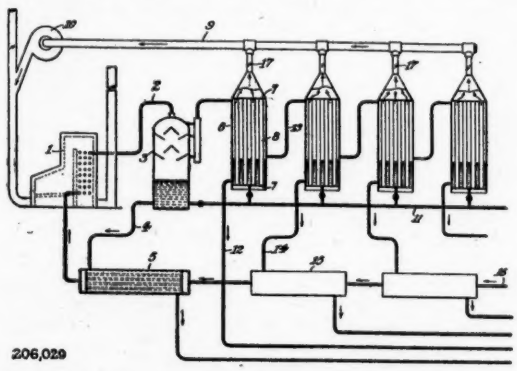
205,984. Ores are subjected to preliminary treatment with oxidising substances to render certain metals such as gold and

silver more easily extracted by leaching. The oxidising agent may be a solution of saltpetre containing 15–30 parts by weight in 100 parts of water. The ore is placed in this solution without preliminary treatment, and heated to 80°–100° C. to accelerate the process. A small quantity of catalyst may also be added, such as sodium chloride, calcium chloride, iron chloride, sulphuric acid, iron sulphate, etc. As an example, a carbonate of lead containing silver may be treated with saltpetre solution containing 1 per cent. of sulphuric acid and 0·5 per cent. of sodium chloride. The silver is rendered readily soluble in hyposulphite lye, giving a yield of 95 per cent. It is found that a solution which has been used is more active than a fresh solution, and the solution may be used several times. The consumption of saltpetre is about 1·5 per cent. of the amount of ore treated. Instead of adding the catalytic agents, a weak electric current may be passed through the oxidising bath between carbon electrodes. The silver present in an ore is thus rendered soluble in a hyposulphite lye.

205,985. It is known that the extraction of metals from ores or metallurgical waste products may be facilitated by heating the ore in a furnace and then spraying a solution of saltpetre over it, or treating it with an oxidising gas containing oxides of nitrogen. It is now found that the action of the oxidising agent may be considerably increased if it is added in a state of fine sub-division, and under pressure. Under these circumstances, it is found that a very small quantity of the oxidising agent is sufficient to transform the ore so that the leaching may be readily effected. The oxidising agent may be saltpetre in a very finely sub-divided state, and the powder is sprayed on to the ore through nozzles in a current of steam or gas. The spraying may be carried out during any period of the heat treatment. In the case of some ores, the oxidising agents may be added during a wet treatment by introducing gaseous oxides of nitrogen under pressure. The maximum proportion of saltpetre necessary to treat the ore by this process is about 1·5 per cent.

206,029. HYDROCARBON OILS, DISTILLATION OF. T. E. Robertson, London. From The Power Specialty Co., 111, Broadway, New York. Application date, November 23, 1922.

The object is to distil crude oil for the recovery of gasoline, kerosene, and the heavier distillates in an apparatus in which the heat developed is fully utilised. Vapour from the still 1 passed through a pipe 2 to a separating tower 3, in which the



206,029

heavy oil collects, and the oil is transferred by a pipe 4 to a heat exchanger 5. The vapour passes to an air-cooled condenser 6 containing vertical tubes 8, which are open at the bottom to the air. The air is drawn upwards through these tubes into a pipe 9 by a fan 10, and the hot air thus obtained is delivered to the furnace 1. The amount of air is regulated by dampers 17. A number of such condensers 6 are employed, connected in series, and superheated steam is admitted by the pipe 11 to the bottom of each condenser, so that the vapour pressure in each may be regulated to produce the required distillate. Superheated steam is also admitted to the bottom of the separating tower 3. The temperature in the first condenser 6 is such that only the wax distillates separate out, and these are drawn off by a pipe 12. Gas oil is condensed in the second condenser, and passes by a pipe 14 to a heat exchanger 15. The crude oil is admitted through the pipe 16 to the heat exchangers 15, 5, so that it is preheated to a high temperature before admission to the still. It is found that by using this apparatus a substantial saving in the quantity of fuel required for the distillation of the oil is obtained.

206,083. *p*-PHENETOL-CARBAMIDE, PROCESS FOR MANUFACTURE OF. A. Sonn, 5, Heumarkt, Königsberg, Germany. Application date, March 15, 1923.

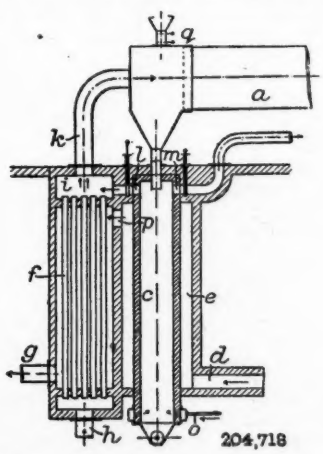
The sweetening substances known as "dulcin" (*p*-phenetol carbamide $C_2H_5O.C_6H_4.NH.CONH_2$) has been made by the action of potassium cyanate on phenetidine hydrochloride, or subsequently by heating phenetidine hydrochloride with urea in an autoclave at 150°—160° C. The principle of the former reaction is employed in this invention, but acetic acid is employed instead of a mineral acid, and the cyanic acid is liberated more slowly, so that no free cyanic acid escapes. An excess of acetic acid may be used to ensure that all the cyanate is decomposed. The yield by this process is 10–30 per cent. higher than when phenetidine hydrochloride is used. The process is still more economical if it is combined with the production of phenacetin. In the latter process, phenetidine is usually treated with a large excess of acetic anhydride to obtain a good yield, but in this process the excess of anhydride is unnecessary since the phenetidine and acetic acid which remain are used for the production of phenetol carbamide. The process thus avoids the loss due to the conversion of acetic anhydride to dilute acetic acid. A solution of *p*-phenetidine 100 parts in dilute acetic acid containing 60 parts of glacial acetic acid, is gradually stirred into a concentrated solution containing 60–70 parts of potassium cyanate yielding *p*-phenetol carbamide which is separated, washed, and dried.

NOTE.—Abstracts of the following specifications which are now accepted, appeared in THE CHEMICAL AGE when they became open to inspection under the International Convention:—195,345 (Holzverkohlungs-Industrie Akt.-Ges.) relating to a process for the chlorination of methane, see Vol. VIII, p. 577.

International Specifications not yet Accepted

204,718. GAS MANUFACTURE. J. Rude, 26, Sonnenbergerstrasse, Wiesbaden, Germany. International Convention date, October 2, 1922.

Fuel in a retort *a* is heated by gases which have been heated in passing through a heat interchanger *f*, from *h* to *k*. The semi-coke from the retort *a* is passed into another retort where it is converted into water gas by means of steam admitted by the pipe *o*. The water gas and ammonia may be with-



204,718

drawn separately, or may mix with the other retort gases and be drawn off at *l* or *m*. The gas passing through the passage *l* mixes with the heating gases from the interchanger *f* in the chamber *i*. The interchanger is heated by means of gases which enter through the conduit *d* to pass around the retort *c*, and then through the opening *p* to heat the interchanger tubes, finally escaping by the pipe *g*.

LATEST NOTIFICATIONS.

207,142 Process for treating ammonium-chloride lyes in iron vessels. Henkel et Cie., and Weber, Dr. W. November 15, 1922

207,162. Manufacture of naphthalene derivatives and of dyestuffs therefrom. Society of Chemical Industry in Basle. November 18, 1922.

207,172. Manufacture of sintered magnesite and magnesite bricks. K. Harr. November 14, 1922.

207,174. Methods of carrying-on electrolytic processes. Siemens and Halske Akt.-Ges. November 15, 1922.

207,196. Process for obtaining sulphur from a gas containing hydrogen sulphide. Farbenfabriken vorm. F. Bayer and Co. November 20, 1922.

207,199. Electrolytic tanks. Carrera, L. A. November 18, 1922.

Specifications Accepted, with Date of Application

181,393. Cellulose ethers, Manufacture of. L. Lilienfeld. June 13 1921.

184,193. Blue vat dyestuff of the anthracene series, Process for the production of. Badische Anilin-and-Soda-Fabrik. August 4, 1921.

184,810. Rotary furnaces. A. H. Pehrson. August 20, 1921.

186,616. Distilling tars, Process for. F. Duplan. September 29, 1921.

189,772. Separating a gas or vapour from a liquid or dissolving a gas or vapour in a liquid, Process and apparatus for. C. Fraisse. December 5, 1921.

192,080. Indiarubber composition. Elektrizitätswerk Lonza Akt.-Ges. January 13, 1922.

199,340. Solid material in a finely divided state, Apparatus for treating with heating or cooling gases. J. M. Lehmann Co., Inc. June 14, 1922.

201,914. Articles which require a high resistance against corrosion by ammonium chloride solutions. F. Krupp Akt.-Ges. August 2, 1922.

201,915. Articles which require a high resistance against attack of sulphurous acid at high temperature and pressure. F. Krupp Akt.-Ges. August 2, 1922.

202,962. Centrifugal separators. Aktiebolaget Separator. August 24, 1922.

206,535. Purification of oils, waxes, and the like. Oil Refining Improvements Co., Ltd., and J. J. Hood. May 4, 1922.

206,542. Plant for the carbonisation of coal. S. R. Illingworth, May 11, 1922.

206,565. Iron ores, Concentration and preparation for smelting. W. W. Tullis and Minerals Separation, Ltd. August 3, 1922.

206,572. Alkali silicate solutions, Production of. L. W. Codd. August 5, 1922.

206,585. Centrifugal separators. Grange Iron Co., Ltd., and H. P. Hoyle. August 8, 1922.

206,638. Vat colouring matters, Manufacture and production of. J. Y. Johnson. (*Badische Anilin and Soda Fabrik*). September 16, 1922.

206,639. Gas generator. J. D. Roots. September 16, 1922.

206,671. Peroxides of nitrogen, Electric apparatus for the production of. F. Stacey. October 13, 1922.

206,672. Screen and crushing apparatus. J. E. Weyman. October 16, 1922.

206,711. Frame to make possible, in the same apparatus, solvent recovery by distillation, after extraction of a substance has been made by that solvent. S. A. de Lacy. November 22, 1922.

206,712. Distilling gas from non-coking bituminous materials at low temperatures, Apparatus for. H. Koppers. November 22, 1922.

206,734. Intermediate compounds. British Dyestuffs Corporation, Ltd., and H. H. Hodgson. December 18, 1922.

206,747. Alcohols, such as absolute alcohol, Process of obtaining—free from water. E. C. R. Marks. (*U.S. Industrial Alcohol Co.*). January 11, 1923.

206,770. Cellulose derivatives, Method of rendering non-inflammable. G. Leysieffer. February 22, 1923.

Applications for Patents

Bollmann, H. Removing odoriferous substances from oils and fats 29210. November 19.

Calvert, G. Manufacture of rubber compounds. 29233. November 20.

Chemische Fabrik in Billwärder vorm. Hell and Sthamer Akt.-Ges. and Weil, L. Manufacture of pure carbazol. 29312. November 20.

Chemische Fabrik in Billwärder vorm. Hell and Sthamer Akt.-Ges. and Weil, L. Manufacture of pure anthracene and carbazol. 29313. November 20.

Chemische Fabrik in Billwärder vorm and L. Weil. Process of obtaining pure anthracene and carbazol from crude anthracene. 29314. November 20. (Germany, January 30).

Delpech, J. Manufacture of collodion artificial silk. 29636. November 24.

Delpech, J. Direct utilization of nitro-cellulose artificial silk in the textile industries. 29637. November 24.

Delpech, J. Dehydration of air containing volatile substances. 29638. November 24.

Howles, F., and McDougall, J. Manufacture of insecticides, etc 29512. November 22.

Hulin, P. L. Preparation of sodium. 29289. November 20.

Lamplough, F. Distillation. 29401. November 21.

Lamplough and Co., Ltd., F. Distillation. 29401. November 21.

Naugatuck Chemical Co. Manufacture of styrol. 29286. November 20. (United States, June 30).

Schindelmeiser, J. Paints, etc. 29290. November 20.

Patents Court Case

AN application has been made under Section 24 of the Patents and Designs Acts, 1907 and 1919, for the following patent to be indorsed " Licences of Right " :—153,290 (Norsk Hydro-Elektrisk Kvaelstofaktieselskab), relating to a catalyser for the synthetic manufacture of ammonia. Any notice of opposition must be given by December 21, 1923.

Re-registration of Japanese Patents Necessary

A LETTER from Ernest Salaman and Co. appeared in *The Times* on Thursday, stating that they had heard from their agent at Tokyo, who, while confirming the destruction by fire in the recent earthquake of the Japanese Patent Office, stated that all the documents, including the original patent registers, were lost. The attention of owners of patents and trade-marks is therefore called to the need of making application for protection under the Japanese Emergency Ordinance for re-registration. Failing this, patentees and trade-mark owners run the risk of losing their rights. It is of great importance that this information shall reach all British manufacturers and traders interested in patents and trade-marks in Japan.

An Alkali Industry in Australia

FROM a statement made in Australia by the director of the Commonwealth Institute of Science and Industry (Sir G. H. Knibbs), there appears to be a strong likelihood (states the *Industrial Australian and Mining Standard*) of an alkali industry being established in Australia in the near future through the co-ordination of three other important industries, viz., the metallurgical treatment of certain ores, manufacture of superphosphates, and the production of paper pulp and newsprint. The first two of these industries are already firmly established and closely related. The conversion of certain local timbers into paper pulp by means of caustic soda has already been shown to be quite practicable, but for this purpose a large part of the alkali used has at present to be imported. This could be avoided if a portion of the sulphur that is wasted in the roasting of certain ores undergoing treatment for recovery of the metals were used in its place. Should investigation prove the manufacture of paper pulp by the other chemical process to be economically feasible, it would also be possible to produce soda by the electrolytic process economically, since the bleaching of the paper pulp would provide a market for the disposal of the chlorine which is such a stumbling-block in the way of increasing the alkali output at the present time. It is estimated that the production of 50,000 tons of paper pulp per annum would require about 2,000 tons of chlorine. With the other uses to which chlorine would be applied, this would permit of the production of about 5,000 tons of caustic soda annually. The quantity of paper pulp made would be sufficient for the manufacture of more than half the present newsprint requirements. The co-ordination of these four industries would be of great and obvious advantage to Australia at all times, and of paramount importance if ever we are unfortunate enough to be engaged in another war.

The American Army Dye Problem

IT has been found that the olive drab shade used by the U.S. Army during the war, being a blend of red, orange, and green, appears red when viewed with field-glasses equipped with devices for filtering out the orange and green rays. A committee of the American Chemical Society, the chemical warfare service and the quartermaster corps is at present directing experiments, in which vat colours, sulphur colours, alizarin colours, and mineral colours will be tried, with the object of finding a true invisible grey from American dyes.

Market Report and Current Prices

Our Market Report and Current Prices are exclusive to THE CHEMICAL AGE, and, being independently prepared with absolute impartiality by Messrs. R. W. Greeff & Co., Ltd., and Messrs. Chas. Page & Co., Ltd., may be accepted as authoritative. The prices given apply to fair quantities delivered ex wharf or works, except where otherwise stated. The current prices are given mainly as a guide to works managers, chemists, and chemical engineers; those interested in close variations in prices should study the market report.

London, November 29, 1923.

THE activity noted in our last report continues, and the advances in price have been well maintained.

Export trade has also been slightly more active.

General Chemicals

ACETONE continues a satisfactory market, and the price is well held.

ACID ACETIC.—The price is maintained, and the material is in good request.

ACID CARBOLIC meets only with a poor demand, although the price is maintained.

ACID CITRIC is in moderately active demand, without change in value.

ACID LACTIC.—The price is very firm and imported supplies extremely scarce.

ACID TARTARIC.—There is only a small inquiry for this product, and the material is without change in value.

FORMALDEHYDE is a shade easier, but the demand is good.

LEAD ACETATE has again advanced in price, and quite a satisfactory volume of business is reported.

LEAD NITRATE is unchanged.

LIME ACETATE maintains its value and is scarce on the spot.

LITHOPONE is very firm and in fair request.

METHYL ALCOHOL is very scarce and inclined to go higher.

POTASSIUM CARBONATE AND CAUSTIC have slightly advanced and the price is likely to go higher.

POTASSIUM PERMANGANATE has still further advanced, and is very scarce.

POTASSIUM PRUSSIATE maintains its value and a satisfactory volume of business is reported, especially on export account.

SODIUM ACETATE is firm, although the demand is on the light side.

SODIUM BICHROMATE is unchanged.

SODIUM HYPOSULPHITE is in good request, and English makers have reduced the price for photographic quality.

SODIUM NITRITE has advanced in price and is scarce.

SODIUM PRUSSIATE.—Only a very moderate business is being transacted. The future outlook is obscure in the extreme, and it is difficult, therefore, to see how a lower price can be expected.

SODIUM SULPHIDE.—The price has advanced sharply, and the material is in good request.

Pharmaceutical Chemicals

ACETYL SALICYLIC ACID is a firm and active market. Price unchanged.

ACETANILID is rapidly moving upwards. Stocks are low and cannot be replenished until new import licences are issued.

AMIDOPYRIN has been in better demand for export.

BETANAPHTHOL RESUBLIMED.—Price is tending upwards. Supplies of reliable quality are difficult to obtain.

BROMIDES are extremely firm, and expected to move to a higher level. Many parcels are reported to have changed hands during the past week.

METHYL SALICYLATE has been in demand, some of the larger parcels having passed into consumers' hands.

PHENOLPHTHALEIN continues in short supply, with the price still tending upwards.

SODA SALICYLATE.—The demand has been such that the leading continental makers are declining orders, their production for the remainder of this year being fully sold.

VANILLIN is in better demand and slightly firmer.

Coal Tar Intermediates

The export market continues to show more interest than the home market, but demand continues quite fair considering the present restricted needs of the colour-consuming industry.

ALPHA NAPHTHOL remains firm with stocks short.

ALPHA NAPHTHYLAMINE is unchanged.

ANILINE OIL is a trace easier, but export demand continues quite good.

BENZIDINE BASE.—A few small orders have been booked.

BETA NAPHTHOL.—Inquiries are reported both on export and home account.

DIMETHYLANILINE.—Foreign buyers are open.

DIPHENYLAMINE has been a fair business at last quoted price.

"H" ACID continues steady, with fair orders being placed.

NAPHTHIONIC ACID is quiet.

NITRO BENZOL.—There is nothing of special interest to report.

PARANITRANILINE has been chiefly in demand on export account.

RESORCIN continues in short supply for spot delivery.

SULPHANILIC ACID.—A few inquiries are reported.

Coal Tar Products

The prices relating to Coal Tar Products this week are as undernoted:—

90% BENZOL is plentiful, and the price is easy at 1s. 2½d. per gallon on rails in tank-wagons.

PURE BENZOL is also plentiful, and is worth about 1s. 6d. to 1s. 7d. per gallon on rails.

CREOSOTE OIL is firm at 8½d. to 8¾d. per gallon in the North, and 9½d. to 9¾d. per gallon in the South.

CRESYLIC ACID is a shade weaker, with no great inquiry. It is worth about 1s. 10d. to 2s. per gallon on rails for the Pale quality 97/99%, while the Dark quality 95/97% is worth 1s. 6d. to 1s. 8d. per gallon.

SOLVENT NAPHTHA is plentiful at 11d. to 1s. per gallon on rails in the North.

HEAVY NAPHTHA is also quiet, and is worth about 1s. per gallon on rails.

NAPHTHALENES are steady at £6 10s. to £7 5s. per ton for the low grade quality, while 74/76 quality is worth about £8 to £8 10s. per ton, and the 76/78 quality is quoted at £8 15s. to £9 5s. per ton.

PITCH.—The demand remains weak, and prices continue to drop. To-day's values are: 120s. to 125s. per ton, f.o.b., London; 115s. to 120s. per ton, f.o.b., East Coast.

Sulphate of Ammonia

The demand is satisfactory. The British Federation's new price list shows a progressive advance up to March–May of next year.

[Current Market Prices on following pages.]

The Paris Conference of Industrial Chemistry

THE October issue of *Chimie et Industrie* contains a brief account of the third congress of Industrial Chemistry recently held in Paris, and the announcement that the full proceedings will be published in a special number now in preparation. The British visitors at the conference included Professor Henry Armstrong, who has already given his impressions in THE CHEMICAL AGE; Mr. J. T. Hewitt, representing the Chemical Society; Dr. H. Levinstein, representing the Society of Chemical Industry; Dr. Lomax, representing the Institution of Petroleum Technologists; Dr. Stephen Miall, representing the Federal Council for Pure and Applied Chemistry; Sir John Russell, director of the Rothamstead laboratories; and Mr. A. R. Smith, representing the Institute of Chemistry. The subjects dealt with were mainly concerned with the chemistry of agriculture, and important communications were made by M. Menozzi of Milan, M. Lindet and Sir John Russell. A feature of the conference was the description by Prince Ginori Conti, of the utilisation of volcanic steam which he has carried out at a central power station in Italy.

Current Market Prices

General Chemicals

	Per	£	s.	d.		£	s.	d.
Acetic anhydride, 90–95%	lb.	0	1	4	to	0	1	5
Acetone oil	ton	80	0	0	to	85	0	0
Acetone, pure	ton	125	0	0	to	126	0	0
Acid, Acetic, glacial, 99–100%	ton	73	0	0	to	74	0	0
Acetic, 80% pure	ton	49	0	0	to	50	0	0
Acetic, 40% pure	ton	24	0	0	to	25	0	0
Arsenic, liquid, 2000 s.g.	ton	85	0	0	to	88	0	0
Boric, commercial	ton	48	0	0	to	52	0	0
Carbolic, cryst. 39–40%	lb.	0	1	0½	to	0	1	1
Citric	lb.	0	1	5	to	0	1	5½
Formic, 80%	ton	52	0	0	to	54	0	0
Hydrofluoric	lb.	0	0	7½	to	0	0	8½
Lactic, 50 vol.	ton	39	0	0	to	40	0	0
Lactic, 60 vol.	ton	45	0	0	to	47	0	0
Nitric, 80 Tw.	ton	24	0	0	to	25	0	0
Oxalic	lb.	0	0	5½	to	0	0	6
Phosphoric, 1.5	ton	35	0	0	to	38	0	0
Pyrogallic, cryst.	lb.	0	5	9	to	0	6	0
Salicylic, technical	lb.	0	1	9½	to	0	2	0
Sulphuric, 92–93%	ton	6	0	0	to	7	0	0
Tannic, commercial	lb.	0	2	3	to	0	2	9
Tartaric	lb.	0	1	0½	to	0	1	1
Alum, lump	ton	12	10	0	to	13	0	0
Chrome	ton	23	0	0	to	24	0	0
Alumino ferric	ton	7	0	0	to	7	5	0
Aluminium, sulphate, 14–15%	ton	8	10	0	to	9	0	0
Sulphate, 17–18%	ton	10	10	0	to	11	0	0
Ammonia, anhydrous	lb.	0	1	6	to	0	1	8
.880	ton	32	0	0	to	34	0	0
.920	ton	22	0	0	to	24	0	0
Carbonate	ton	30	0	0	to	32	0	0
Chloride	ton	50	0	0	to	55	0	0
Muriate (galvanisers)	ton	32	0	0	to	33	0	0
Nitrate (pure)	ton	40	0	0	to	45	0	0
Phosphate	ton	63	0	0	to	65	0	0
Sulphocyanide, commercial 90%	lb.	0	1	1	to	0	1	3
Amyl acetate, technical	ton	280	0	0	to	300	0	0
Arsenic, white powdered	ton	65	0	0	to	68	0	0
Barium, carbonate, Witherite	ton	5	0	0	to	6	0	0
Carbonate, Precip.	ton	15	0	0	to	16	0	0
Chlorate	ton	65	0	0	to	70	0	0
Chloride	ton	15	0	0	to	15	10	0
Nitrate	ton	33	0	0	to	35	0	0
Sulphate, blanc fixe, dry	ton	20	10	0	to	21	0	0
Sulphate, blanc fixe, pulp	ton	10	5	0	to	10	10	0
Sulphocyanide, 95%	lb.	0	0	11	to	0	1	0
Bleaching powder, 35–37%	ton	10	7	6	to	10	17	6
Borax crystals, commercial	ton	25	0	0	to		—	
Calcium acetate, Brown	ton	13	0	0	to	14	0	0
Grey	ton	22	0	0	to	23	0	0
Carbide	ton	13	0	0	to	13	10	0
Chloride	ton	5	15	0	to	6	0	0
Carbon bisulphide	ton	35	0	0	to	40	0	0
Casein technical	ton	80	0	0	to	90	0	0
Cerium oxalate	lb.	0	3	0	to	0	3	6
Chromium acetate	lb.	0	1	1	to	0	1	3
Cobalt acetate	lb.	0	6	0	to	0	6	6
Oxide, black	lb.	0	9	6	to	0	10	0
Copper chloride	lb.	0	1	1	to	0	1	2
Sulphate	ton	25	0	0	to	25	10	0
Cream Tartar, 98–100%	ton	86	0	0	to	88	0	0
Epsom salts (*see* Magnesium sulphate)								
Formaldehyde, 40% vol.	ton	65	0	0	to	66	0	0
Formusol (Rongalite)	lb	0	1	11	to	0	2	0
Glauber salts, commercial	ton	4	0	0	to	4	10	0
Glycerin crude	ton	65	0	0	to	67	10	0
Hydrogen peroxide, 12 vols.	gal	0	2	0	to	0	2	1
Iron perchloride	ton	18	0	0	to	20	0	0
Sulphate (Copperas)	ton	3	10	0	to	4	0	0
Lead acetate, white	ton	44	0	0	to	46	0	0
Carbonate (White Lead)	ton	50	0	0	to	52	0	0
Nitrate	ton	44	10	0	to	45	0	0
Litharge	ton	37	0	0	to	39	0	0
Lithophone, 30%	ton	22	10	0	to	23	0	0
Magnesium chloride	ton	3	10	0	to	3	15	0
Carbonate, light	cwt.	2	10	0	to	2	15	0
Sulphate (Epsom salts commercial)	ton	5	15	0	to	6	0	0
Sulphate (Druggists')	ton	8	0	0	to	9	0	0
Manganese Borate, commercial	ton	65	0	0	to	75	0	0
Sulphate	ton	45	0	0	to	50	0	0
Methyl acetone	ton	82	0	0	to	85	0	0
Alcohol 1% acetone	ton	80	0	0	to	85	0	0
Nickel sulphate single salt	ton	37	0	0	to	38	0	0
Ammonium sulphate, double salt	ton	37	0	0	to	38	0	0
Potash, Caustic	ton	30	0	0	to	32	0	0
Potassium bichromate	lb.	0	0	5½	to	0	0	6
Carbonate, 90%	ton	30	0	0	to	31	0	0
Chloride, 80%	ton	9	0	0	to	10	0	0
Chlorate	lb.	0	0	3½	to		—	
Metabisulphite, 50–52%	ton	65	0	0	to	70	0	0
Nitrate, refined	ton	38	0	0	to	40	0	0
Permanganate	lb.	0	0	10½	to	0	0	10½
Prussiate, red	lb.	0	2	10	to	0	3	0
Prussiate, yellow	lb.	0	0	10½	to	0	0	11
Sulphate, 90%	ton	10	0	0	to	10	10	0
Salammoniac, firsts	cwt.	2	15	0	to		—	
Seconds	cwt.	2	17	6	to		—	
Sodium acetate	ton	25	0	0	to	25	10	0
Arsenate, 45%	ton	45	0	0	to	48	0	0
Bicarbonate	ton	10	10	0	to	11	0	0
Bichromate	lb.	0	0	4½	to	0	0	4½
Bisulphite, 60–62%	ton	21	0	0	to	23	0	0
Chlorate	lb.	0	0	3	to	0	0	3½
Caustic, 70%	ton	17	10	0	to	18	0	0
Caustic, 76%	ton	18	10	0	to	19	0	0
Hydrosulphite, powder	lb.	0	1	5	to	0	1	6
Hyposulphite, commercial	ton	10	10	0	to	11	0	0
Nitrite, 96–98%	ton	27	10	0	to	28	0	0
Phosphate, crystal	ton	16	0	0	to	16	10	0
Perborate	lb.	0	0	11	to	0	1	0
Prussiate	lb.	0	0	6	to		—	
Sulphide, crystals	ton	8	10	0	to	9	0	0
Sulphide, solid, 60–62 %	ton	15	0	0	to	16	10	0
Sulphite, cryst.	ton	11	10	0	to	12	0	0
Strontium carbonate	ton	50	0	0	to	55	0	0
Nitrate	ton	50	0	0	to	55	0	0
Sulphate, white	ton	6	10	0	to	7	10	0
Sulphur chloride	ton	25	0	0	to	27	10	0
Flowers	ton	11	0	0	to	11	10	0
Roll	ton	9	15	0	to	10	10	0
Tartar emetic	lb.	0	0	11½	to	0	1	0
Tin perchloride, 33%	lb.	0	1	1	to	0	1	2
Perchloride, solid	lb.	0	1	3	to	0	1	4
Protochloride (tin crystals)	lb.	0	1	4	to	0	1	5
Zinc chloride 102° Tw.	ton	20	0	0	to	21	0	0
Chloride, solid, 96–98%	ton	25	0	0	to	30	0	0
Oxide, 99%	ton	42	0	0	to	45	0	0
Dust, 90%	ton	50	0	0	to	55	0	0
Sulphate	ton	15	0	0	to	16	0	0

Pharmaceutical Chemicals

Acetyl salicylic acid	lb.	0	3	9	to	0	4	0
Acetanilid	lb.	0	3	3	to	0	3	6
Acid, Gallic, pure	lb.	0	3	0	to	0	3	3
Lactic, 1.21	lb.	0	2	8	to	0	3	0
Salicylic, B.P.	lb.	0	2	5	to	0	2	7
Tannic, leviss.	lb.	0	3	2	to	0	3	4
Amidol	lb.	0	7	6	to	0	8	0
Amidopyrin	lb.	0	13	6	to	0	14	0
Ammon ichthosulphonate	lb	0	1	10	to	0	2	0
Barbitone	lb.	0	17	6	to	0	18	6
Beta naphthol resublimed	lb.	0	2	3	to	0	2	6
Bromide of ammonia	lb	0	0	10	to	0	1	0
Potash	lb.	0	0	8	to	0	0	9
Soda	lb.	0	0	8½	to	0	0	9½
Caffeine, pure	lb.	0	11	0	to	0	11	6
Calcium glycerophosphate	lb.	0	5	9	to	0	6	0
Lactate	lb.	0	2	0	to	0	2	3
Calomel	lb.	0	3	9	to	0	4	0
Chloral hydrate	lb.	0	4	0	to	0	4	3
Cocaine alkaloid	oz.	0	19	6	to	1	0	0
Hydrochloride	oz.	0	16	9	to	0	17	3
Corrosive sublimate	lb.	0	3	3	to	0	3	6
Eucalyptus oil, B.P. (70–75% eucalyptol)	lb.	0	2	6	to	0	2	8
B.P. (75–80% eucalyptol)	lb.	0	2	7	to	0	2	9
Guaiacol carbonate	lb.	0	12	9	to	0	13	3
Liquid	lb.	0	8	9	to	0	9	3
Pure crystals	lb.	0	9	3	to	0	9	9
Hexamine	lb.	0	4	3	to	0	4	6
Hydroquinone	lb.	0	4	3	to	0	4	6
Lanoline anhydrous	lb.	0	0	7	to	0	0	6
Lecithin ex ovo	lb.	1	5	0	to	1	7	6
Lithi carbonate	lb.	0	9	6	to	0	10	0
Methyl salicylate	lb.	0	2	10	to	0	3	3
Metol	lb.	0	9	0	to	0	10	0
Milk sugar	cwt.	4	2	6	to	4	10	0
Paraldehyde	lb.	0	1	7	to	0	1	9
Phenacetin	lb.	0	7	6	to	0	8	0
Phenazone	lb.	0	8	6	to	0	9	0
Phenolphthalein	lb.	0	8	3	to	0	8	9
Potassium sulpho guaiacolate	lb.	0	7	0	to	0	7	6
Quinine sulphate, B.P.	oz.	0	2	3	to		—	

	Per	£	s.	d.		£	s.	d.
Resorcin, medicinal	lb.	0	5	9	to	0	6	0
Salicylate of soda powder	lb.	0	3	0	to	0	3	3
Crystals	lb.	0	3	0	to	0	3	3
Salol	lb.	0	4	0	to	0	4	3
Soda Benzoate	lb.	0	3	6	to	0	3	9
Sulphonal	lb.	0	17	6	to	0	18	6
Terpene hydrate	lb.	0	1	9	to	0	2	0
Theobromine, pure	lb.	0	11	0	to	0	11	6
Soda salicylate	lb.	0	8	6	to	0	9	0
Vanillin	lb.	1	3	6	to	1	4	6

Coal Tar Intermediates, &c.

Alphanaphthol, crude	lb.	0	2	0	to	0	2	3
Refined	lb.	0	2	6	to	0	2	9
Alphanaphthylamine	lb.	0	1	6½	to	0	1	7
Aniline oil, drums extra	lb.	0	0	9	to	0	0	9½
Salts	lb.	0	0	9½	to	0	0	10
Anthracene, 40–50%	unit	0	0	8½	to	0	0	9
Benzaldenyde (free of chlorine)	lb.	0	2	6	to	0	2	9
Benzidine, base	lb.	0	4	9	to	0	5	0
Sulphate	lb.	0	3	9	to	0	4	0
Benzoic acid	lb.	0	2	0	to	0	2	3
Benzyl chloride, technical	lb.	0	2	0	to	0	2	3
Betanaphthol	lb.	0	1	1	to	0	1	2
Betanaphthylamine, technical	lb.	0	4	0	to	0	4	3
Croceine Acid, 100% basis	lb.	0	3	3	to	0	3	6
Dichlorbenzol	lb.	0	0	9	to	0	0	10
Diethylaniline	lb.	0	4	6	to	0	4	9
Dinitrobenzol	lb.	0	1	1	to	0	1	2
Dinitrochlorbenzol	lb.	0	0	11	to	0	1	0
Dinitronaphthalene	lb.	0	1	4	to	0	1	5
Dinitrotoluol	lb.	0	1	4	to	0	1	5
Dinitrophenol	lb.	0	1	6	to	0	1	7
Dimethylaniline	lb.	0	2	9	to	0	3	0
Diphenylamine	lb.	0	3	6	to	0	3	9
H-Acid	lb.	0	4	9	to	0	5	0
Metaphenylenediamine	lb.	0	4	0	to	0	4	3
Monochlorbenzol	lb.	0	0	10	to	0	1	0
Metanilic Acid	lb.	0	5	9	to	0	6	0
Metatoluylenediamine	lb.	0	4	0	to	0	4	3
Monosulphonic Acid (2.7)	lb.	0	8	6	to	0	9	6
Naphthionic acid, crude	lb.	0	2	6	to	0	2	8
Naphthionate of Soda	lb.	0	2	6	to	0	2	8
Naphthylamine-di-sulphonic-acid	lb.	0	4	0	to	0	4	3
Nevill Winther Acid	lb.	0	7	3	to	0	7	9
Nitrobenzol	lb.	0	0	7	to	0	0	8
Nitronaphthalene	lb.	0	0	11½	to	0	1	0
Nitrotoluol	lb.	0	0	8	to	0	0	9
Orthoamidophenol base	lb.	0	12	0	to	0	12	6
Orthodichlorbenzol	lb.	0	1	0	to	0	1	1
Orthotoluidine	lb.	0	0	10	to	0	0	11
Orthonitrotoluol	lb.	0	0	3	to	0	0	4
Para-amidophenol, base	lb.	0	8	6	to	0	9	0
Hydrochlor	lb.	0	7	6	to	0	8	0
Paradichlorbenzol	lb.	0	0	9	to	0	0	10
Paranitraniline	lb.	0	2	7	to	0	2	9
Paranitrophenol	lb.	0	2	3	to	0	2	6
Paranitrotoluol	lb.	0	2	9	to	0	3	0
Paraphenylenediamine, distilled	lb.	0	12	0	to	0	12	6
Paratoluidine	lb.	0	5	6	to	0	5	9
Phthalic anhydride	lb.	0	2	6	to	0	2	9
Resorcin technical	lb.	0	4	0	to	0	4	3
Sulphanilic acid, crude	lb.	0	0	10	to	0	0	11
Tolidine, base	lb.	0	7	3	to	0	7	9
Mixture	lb.	0	2	6	to	0	2	9

Essential Oils and Synthetics

Essential Oils.		£	s.	d.
Anise	c.i.f. 1/9 spot	0	1	10
Bay		0	12	0
Bergamot		0	13	6
Cajaput		0	3	3
Camphor, white	per cwt.	4	0	0
Brown	„	3	15	0
Cassia	easier, c.i.f. 9/- spot	0	10	6
Cedarwood	firmer	0	1	6
Citronella (Ceylon)	scarce and firm, c.i.f. 3/10½ spot	0	4	2
(Java)	firm, c.i.f. 4/4 spot	0	4	7
Clove	firmer	0	9	6
Eucalyptus		0	2	6
Geranium Bourbon		1	15	0
Lavender	firm	1	6	0
Lavender spike	firm	0	3	3
Lemon		0	2	10
Lemongrass	per oz.	0	0	2½
Lime (distilled)	firm	0	4	0
Orange sweet (Sicilian)		0	10	6
(West Indian)		0	8	6
Palmarosa		1	3	0
Peppermint (American)		0	16	0
Mint (dementholised Japanese)		0	12	3
Patchouli		1	10	0
Otto of Rose	per oz.	1	15	0
Rosemary	firmer	0	1	9
Sandalwood	easier	1	5	0
Sassafras	firm	0	7	6
Thyme	2/6 to	0	8	0

Synthetics.		£	s.	d.
Benzyl acetate	per lb.	0	3	3
Benzoate	„	0	3	6
Citral	„	0	9	6
Coumarine	„	1	0	0
Heliotropine	„	0	8	0
Ionone	„	1	5	0
Linalyl acetate	„	1	2	6
Methyl salicylate	„	0	2	6
Musk xylol	„	0	12	6
Terpeniol	„	0	2	9

Delivery of German Dyestuffs

THE agreement made between the Rhineland High Commission and certain German dyeworks concerning the resumption of Reparation deliveries of dyestuffs does not, it is stated, affect deliveries to Great Britain. The Coblence agreement, although signed on behalf of the High Commission as a whole, is only concerned with deliveries to Belgium, France, and Italy. With regard to Great Britain's share in dyestuffs, deliveries of which, unlike those of France and Belgium, have continued during the period of the Ruhr occupation, this is forming the subject of separate negotiations between British firms and Biers' Dye Works at Leverkusen, which are situated in the British zone of occupation. This is the explanation of the exclusion of Great Britain from the agreement, which it was feared in some quarters might have been due to less natural causes. The point of principle involved—namely, whether the High Commission is a body competent to make an agreement of this kind with regard to Reparation deliveries, is therefore one that may be left to the Governments immediately concerned.

Reimbursement of German Reparations Levy

BY a Decree of the German Government, dated November 15, all payments in connection with the reimbursement of the levy under the German Reparation (Recovery) Act, 1921, are suspended. The Decree came into force on November 17. Contracts concluded before this date are excluded from its provisions, provided the contracts were notified to the "Friedensvertrag-Abrechnungsstelle G. m. b. H. Charlottenburg, Berliner Strasse 17" within two weeks of the coming into force of the Decree (*i.e.*, before December 1), and a certified copy of the contract was enclosed. In the case of such contracts, the amount of the levy will be reimbursed provided that the British Customs receipt is presented to the "Friedensvertrag-Abrechnungsstelle" by March 31, 1924. The German Government reserves the right to reimburse in cash or in loan or other Government obligations.

The Prevention of Stone Deterioration

INVESTIGATIONS are now being made at the American Bureau of Standards covering the action of frost on building stone and on the value of colourless waterproofing materials with which to protect the surface of stone structures. Recently the series of exposure tests on colourless waterproofing materials, having for its object the determination of the relative durability of these treatments under weather conditions, has been supplemented by a series of tests to determine the efficiency of different waterproofing materials in preventing decay of the stone. Crystallisation tests are being made on waterproofed specimens of stone, as mentioned in the last bulletin, to secure a comparison between treated and untreated specimens. Waterproofed specimens have also been exposed to the weather, and will be tested after a considerable period of exposure.

Scottish Chemical Market

The following notes on the Scottish Chemical Market are specially supplied to THE CHEMICAL AGE *by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing the firm's independent and impartial opinions.*

Glasgow, November 29, 1923.

THE German Government having now confirmed their intention of refusing to refund the 26 per cent. Reparations Duty, prices of all German products are materially advanced. As a result of this, some British producers have already advanced their prices, although generally prices of British products are on about a level with those quoted last week.

Industrial Chemicals

ACID ACETIC.—Inquiry for export still well maintained. Glacial, 98/100%. £60 to £66 per ton; 80% pure, £49 to £50 per ton; 80% technical, £46 to £47 per ton, all packed in casks delivered, c.i.f. U.K. ports, duty free.

ACID BORACIC.—Crystals or granulated, £48 per ton; powdered, £50 per ton, carriage paid U.K. stations, minimum ton lots.

ACID CARBOLIC (Ice Crystals).—In little demand. Unchanged at about 1s. 1½d. per lb., f.o.b. U.K. port.

ACID CITRIC.—B.P. Crystals price unchanged at about 1s. 4¾d. per lb., less 5% ex store.

ACID FORMIC 85%.—Spot materials still on offer at about £51 per ton, ex store.

ACID HYDROCHLORIC.—In little demand. Price 6s 6d. per carboy, ex works.

ACID NITRIC 80°.—£23 10s. per ton, ex station, full truck loads.

ACID OXALIC.—Nominally 5¾d. per lb., ex store.

ACID SULPHURIC 144°.—£3 15s. per ton; 168°, £7 per ton ex works, full truck loads. Dearsenicated quality, 20s. per ton more.

ACID TARTARIC B.P. Crystals.—Moderate inquiry, price unchanged at 1s. 1d. per lb., less 5% ex wharf.

ALUMINA SULPHATE 17/18% Iron Free.—Quoted £8 5s. per ton, c.i.f. U.K. port, prompt shipment. Spot lots obtainable at about £8 12s. 6d. per ton, ex store.

ALUM, CHROME.—Inclined to be higher at about £26 to £29 per ton, according to quality.

ALUM, POTASH (Lump).—English material about £10 17s. 6d. per ton, f.o.b. U.K. port. Spot lots of continental material now quoted £11 10s. per ton, ex store.

AMMONIA, ANHYDROUS.—In little demand. Price unchanged at about 1s. 5½d. per lb., ex station, spot delivery.

AMMONIA CARBONATE.—Lump, £29 5s. per ton; powder, £31 per ton, f.o.b. U.K. port for export.

AMMONIA LIQUID 880°.—Unchanged at 3d per lb., delivered, containers extra.

AMMONIA MURIATE.—Grey galvanizers quality quoted £33 to £34 per ton, f.o.b. U.K. port for export. Spot lots now quoted at about the same figure ex station. Fine white crystals, £27 10s. per ton, ex store.

AMMONIA SULPHATE.—25¼% material, £13 2s. per ton; 25¾% neutral quality, £14 5s. per ton, ex works. November delivery.

ARSENIC, WHITE POWDERED.—Very little Cornish material offered. Price for spot lots about £73 to £74 per ton, ex store. Offered from the continent at about £63 per ton, c.i.f. U.K. port.

BARIUM CHLORIDE, 98/100%.—English material now quoted £15 per ton. Spot lots of continental still on offer at about £14 per ton, ex store.

BARYTES.—Finest white English unchanged at £5 5s. per ton, ex works. Good quality continental material offered at £5 per ton, c.i.f. U.K. ports.

BLEACHING POWDER.—Spot lots £11 5s. per ton, ex station. Contracts 20s. per ton less.

BORAX.—Granulated, £24 10s. per ton; crystal, £25 per ton; powdered, £26 per ton, carriage paid U.K. stations, minimum ton lots.

CALCIUM CHLORIDE.—English material, £5 12s. 6d. per ton ex station. Offered for export at about £4 10s. per ton, f.o.b. U.K. port.

COPPERAS.—Moderate export inquiry. Price about £2 10s. per ton. f.o.b. U.K. port.

COPPER SULPHATE.—Inclined to be lower at about £25 5s. per ton, less 5 per cent. f.o.b. U.K. port.

FORMALDEHYDE, 40%.—In good demand. Now quoted £64 to £65 per ton, ex store.

GLAUBER SALTS.—Fine white crystals unchanged at about £3 10s. per ton, ex store, spot delivery. Still on offer from the continent at about £3 per ton, c.i.f. U.K. port.

LEAD, RED.—English material unchanged at £45 per ton carriage paid U.K. stations. Continental now quoted £36 per ton, c.i.f. U.K. ports. Spot material about £37 10s. per ton, ex store.

LEAD, WHITE.—Spot lots of continental material now quoted £41 per ton, ex store.

LEAD, ACETATE.—Moderate export inquiry. English material quoted at about £42 to £44 per ton, f.o.b. U.K. port. Spot lots of continental material still obtainable at the same figure.

MAGNESITE CALCINED.—Finest English material offered at £8 per ton, ex station.

MAGNESIUM CHLORIDE.—Spot lots now quoted £3 15s. per ton, ex store. Still on offer from the continent at about £2 10s. per ton, c.i.f. U.K. ports.

MAGNESIUM SULPHATE (EPSOM SALTS).—Commercial quality offered at about £5 per ton, ex store. B.P. quality, £6 5s. per ton, ex station, prompt delivery.

POTASH, CAUSTIC, 88/92%.—Now quoted £33 per ton, ex store, spot delivery.

POTASSIUM BICHROMATE.—Unchanged at 5¾d. per lb., delivered.

POTASSIUM CARBONATE, 96/98%.—Price for spot material advanced to about £30 per ton, ex store. Fresh supplies practically unobtainable.

POTASSIUM CHLORATE.—Spot lots quoted 3½d. per lb., ex store.

POTASSIUM NITRATE (SALTPETRE).—Spot material higher at about £32 per ton, ex store.

POTASSIUM PERMANGANATE.—B.P. crystals unchanged at about 10½d. per lb., ex store, spot delivery.

POTASSIUM PRUSSIATE (YELLOW).—Quoted 10½d. per lb., f.o.b. U.K. port. Spot lots about 10¾d. per lb., ex station.

SODA, CAUSTIC.—76/77%, £19 7s. 6d. per ton; 70/72%, £17 17s. 6d. per ton; 60/62%, broken, £19 2s. 6d. per ton; 98/99%, powdered, £22 15s. per ton. All ex station, spot delivery. Contracts, 20s. per ton less.

SODIUM ACETATE.—Continental supply unobtainable. Spot material now quoted about £26 per ton, ex store.

SODIUM BICARBONATE.—Refined recrystallised quality £10 10s. per ton, ex quay or station. M.W. quality 30s. per ton less.

SODIUM BICHROMATE.—Unchanged at 4½ per lb., delivered.

SODIUM CARBONATE.—Soda crystals, £5 to £5 5s. per ton, ex quay or station. Alkali 58%, £8 12s. 3d. per ton, ex quay or station.

SODIUM HYPOSULPHITE.—English makers' price about £10 per ton, ex station. Continental obtainable at about the same figure. Pea crystals quoted £15 per ton, ex store.

SODIUM NITRATE.—Refined 96/98% quality unchanged at about £13 5s. per ton, f.o.r. or f.o.b. U.K. port.

SODIUM NITRITE 100%.—Quoted £26 to £27 10s. per ton, according to quantity, f.o.b. U.K. port.

SODIUM PRUSSIATE (YELLOW).—In little demand. Price about 5½d. per lb., ex store.

SODIUM SULPHATE (SALTCAKE).—Price for home consumption £4 5s. per ton, carriage paid stations. Good export inquiry.

SODIUM SULPHIDE.—60/65% solid, £15 per ton, ex station; broken £1 per ton more; 31/34% crystals, £9 7s. 6d. per ton, ex station.

SULPHUR.—Flowers, £10 per ton; roll, £9 per ton; rock, £9 per ton; ground, £8 per ton. Prices nominal.

TIN CRYSTALS.—Unchanged at 1s. 3¾d. per lb., f.o.b. U.K. port or delivered.

ZINC CHLORIDE.—98/100% solid offered at about £26 per ton, f.o.b. U.K. port, for export.

ZINC SULPHATE.—Continental material now quoted £15 per ton, ex store, spot delivery.

NOTE.—The above prices are for bulk business, and are not to be taken as applicable to small parcels.

Coal Tar Intermediates and Wood Distillation Products

ALPHA NAPHTHYLAMINE.—Home inquiries. Price 1s. 6d. to 1s. 6½d. per lb.

BENZYL CHLORIDE.—Export inquiry. Price 1s. 10d. per lb. f.o.b., packages included.

BENZALDEHYDE.—Some home inquiry. Price 2s. 6d. per lb., delivered.

BETA OXYNAPHTHOIC ACID.—Supplies are offered at 10s. per lb., delivered.

BETA NAPHTHOL.—Demand good. Price firm at 1s. 1d. per lb., delivered.

DIPHENYLAMINE.—Good home demand. Price 3s. 3d. per lb.

META TOLUYLENE DIAMINE.—Some export inquiry. Price 4s. per lb., f.o.b.

META PHENYLENE DIAMINE.—In good demand for export. Price 4s. 6d. per lb., f.o.b.

NAPHTHIONATE OF SODA.—Home inquiries. Price 2s. 8d. per lb., 100% basis.

ORTHO NITROTOLUOL.—Supplies are offered at 4d. per lb., delivered.

Catalogues Received

PETER BROTHERHOOD, LTD.—This Peterborough firm have produced an excellent brochure entitled "Steam Turbines," which describes various types of turbines installed by the firm for the generation of electric power.

THE STANTON IRONWORKS CO., LTD.—A leaflet recently issued by this firm from their works near Nottingham deals with concrete pipes of various sizes, reinforced and non-reinforced, which are kept in stock ready for delivery.

C. MITCHELL.—These engineers, of Milo Road, East Dulwich London, S.E., have issued an attractive, illustrated booklet describing the "Cheyne" mixing and grinding machine, which is an interesting device for handling pigments.

THE HARRIS FURNACE CO., LTD.—A beautifully produced brochure issued by this firm from Windsor Street, Attercliffe Road, Sheffield, entitled "The Harris Way," describes the special features of the Harris furnace for roasting pyrites, zinc blende, and similar ores.

MANLOVE, ALLIOTT AND CO., LTD.—An illustrated sheet showing various types of drying machines for the chemical and allied trades has been issued by this firm from their Bloomsgrove Works, Nottingham. The types shown include film, vacuum, rotary and centrifugal driers and other special patterns.

THE BRUSH ELECTRICAL ENGINEERING CO., LTD.—An attractively produced brochure (catalogue No. 500) issued by this firm from Falcon Works, Loughborough, deals with induction motors, and particulars are given of many patterns, both slip-ring and squirrel cage types, for pressures up to 650 volts. Copies of the catalogue will be sent to readers on request.

WM. R. DELL AND SON.—This firm's Mill Furnishing List is a useful little catalogue of equipment for factories and works, and includes particulars and prices of such sundries as belting, pulleys, elevator buckets, etc., and also particulars of larger items, such as crushers, hoppers, conveyors, etc. The address of the firm is 57, Mark Lane, London, E.C.3.

H. T. WATSON.—Spray nozzles of various types and made in a variety of materials for different purposes are the speciality of the Monarch Manufacturing Works of Philadelphia. Mr. H. T. Watson, of 46, Fairfield Road, Widnes, Lancs, is the sole agent in this country for the Monarch chemical sprays, and issues a useful illustrated catalogue of the range of these devices.

FOSTER INSTRUMENT CO.—This well-known firm, manufacturing electrical instruments, have recently issued a new catalogue (No. 31) from their works at Letchworth, Herts. Points of particular interest in it are that it covers thermo-couples of the "base metal" cheap type, and also of the "rare metal" platinum alloy type. Both types are available in well-protected industrial form, and also in small and convenient sizes for laboratory work. Indicating and recording instruments all employ the patent "Resilia" mounting providing an instrument of high sensitivity and, at the same time, industrial robustness. Full theoretical notes are included which will be of interest to all users of this class of apparatus.

The Manchester Chemical Market

(FROM OUR OWN CORRESPONDENT.)

Manchester, November 29, 1923.

PRICES have been very steady on this market during the past week, although business has been quieter again. An interesting event has been the rejection by the Lancashire spinners of American cotton of the proposed continuation of organised short time, the reason being the recent improvement in the demand. Any general expansion of business in the consuming industries will be very quickly reflected in the demand for chemicals, as stocks in users' hands, having regard to the restricted scale of buying operations for some considerable time, must be very low.

Heavy Chemicals

Bleaching powder keeps steady at £11 5s. per ton, though the demand at the moment is only moderate. Caustic soda prices are maintained at £16 17s. 6d. per ton for 60 per cent. material and £19 7s. 6d. for 76–77 per cent., a good volume of trade being put through on export account. Nitrate of soda is dearer at round £28 per ton, due to scarcity rather than to a very pressing demand. Glauber salts are rather quiet, although prices are steady at £3 15s. per ton. Sulphide of sodium is quite firm at £14 to £14 10s. per ton for 60–65 per cent. concentrated solid, and £9 per ton for crystals, notwithstanding the fact that the demand for this material is still on a small scale. Prussiate of soda also continues quiet at 5½d. to 5¾d. per lb. Saltcake is being actively taken up on account of foreign buyers, with the home demand still subdued; prices are unchanged at about £4 10s. per ton. Bicarbonate of soda is steady and in fair demand at £10 10s. per ton. Chlorate of soda is moderately active at 2⅝d. to 2¾d. per lb. Soda crystals are steady but rather quiet at £5 5s. per ton. Phosphate of soda is maintained at between £14 and £14 10s. per ton, but not much business is being done. Acetate of soda is firm and in fair demand at £23 10s. to £24 per ton. Both home and foreign buyers of alkali are placing orders and prices are unchanged from last week, to-day's value being on the basis of £7 10s. per ton for 58 per cent. material. Bichromate of soda is in quietly steady demand at 4½d. per lb.

The position of carbonate of potash and caustic potash is about unchanged, with values more or less nominal in view of the Continental position; 90 per cent. carbonate is quoted at £23, and 96 per cent. at £25 per ton, with caustic priced at between £29 and £30 per ton. Yellow prussiate of potash is steady, but only in quiet demand at 10½d. per lb. Permanganate of potash is also inactive, with values ranging from 8½d. to 9½d. per lb. Chlorate of potash meets with a moderate inquiry, with values steady at round 2¾d. per lb.

Arsenic appears to be again reaching the level of the quotations ruling earlier in the year, the resumed export inquiry, coupled with not too extensive stocks, forcing up prices; for white powdered, Cornish makes, round £70 per ton, Manchester, is now being quoted. Sulphate of copper is still quiet at about £25 10s. per ton, f.o.b. Epsom salts are firmly maintained at £4 to £4 5s. per ton for commercial, with magnesium sulphate, B.P., quoted at £6 to £6 10s. per ton. Nitrate of lead is steady but only in quiet demand at £42 to £43 per ton. Acetate of lead is scarce and firm at £44 to £45 for white and £45 to £46 per ton for brown. Grey acetate of lime is steady at £22, with brown quoted at £14.

Acids and Tar Products

No price changes have to be reported in the case of acids, while business has only been of a moderate character. Tartaric and citric are on offer at 1s. 1½d to 1s. 4½d. per lb. respectively, with oxalic acid quoted at 5½d. to 5¾d. per lb. Acetic acid continues on the basis of £46 per ton for 80 per cent. commercial and round £65 per ton for glacial.

Foreign buying of pitch shows little sign of activity, and prices are easier again at round £6 per ton, f.o.b. The demand for creosote oil is better, and prices are firm at 9d. per gallon. Solvent naphtha is quiet at an average price of 1s. 2d. per gallon. Naphthalenes are steady at about £19 for refined and from £6 to £11 per ton, according to grade, for crude. Carbolic acid is still quiet, but as supplies are not excessive prices are unchanged from last week at round 3s. 3d. per gallon for crude and 1s. 1d. per lb. for crystals.

Company News

ANACONDA COPPER MINING.—The usual quarterly dividend of 75 cents is announced.

PARKE'S DRUG STORES.—An interim dividend of 2½ per cent., less tax, is announced on the ordinary shares for the half-year to August 31 last.

BOOTS PURE DRUG CO.—An interim dividend of 1s. 9¾d. per share, less tax, has been declared on the ordinary shares payable on January 1 next.

W. H. DORMAN AND CO.—The report for the year ended July 31 last states that after providing for depreciations, bad debts, and interest on notes and debentures, there has been a loss of £47,012 for the year, from which is deducted the small credit balance brought forward of £47,002.

ANGLO PERSIAN OIL CO., LTD.—At a meeting of the directors held on Tuesday it was decided to recommend at the forthcoming general meeting to be held on December 17, a dividend on the ordinary shares at the rate of 10 per cent. per annum, less tax, for the year ended March 31 last, and to carry forward, subject to excess profits duty and corporation tax, £1,777,788.

CASTNER-KELLNER ALKALI CO.—The net profits for the year ended September 30 last were £263,188, and £55,494 was brought forward, making a total of £318,682. A final dividend of 12 per cent. is recommended, making 20 per cent. for the year, payable on December 5. £75,000 is placed to suspense account and £36,331 is carried forward. The directors in their report for the year state that they consider the depreciation reserve account is at the present time ample, and therefore do not propose to add to it on this occasion. The usual £5,000 has been paid to the trustees for debenture stockholders for sinking fund, and invested in their names. The annual meeting will be held at 7, Cavendish Square, London, on December 5, at noon.

Chemical Trade Inquiries

The following inquiries, abstracted from the "Board of Trade Journal," have been received at the Department of Overseas Trade (Development and Intelligence), 35, Old Queen Street, London, S.W.1. British firms may obtain the names and addresses of the inquirers by applying to the Department (quoting the reference number and country), except where otherwise stated.

HEAVY CHEMICALS, VEGETABLE OILS, ETC., FOR SWEDEN.—A firm of commission agents in Stockholm desire to secure the representation for Sweden of British manufacturers of heavy chemicals, soya oil and other vegetable oils, and East coast or Scotch pig iron. (Reference No. 591.)

LINSEED OIL.—A firm of commission agents in Gothenburg, desire to secure the representation for Sweden of a British firm, manufacturing and exporting linseed oil, boiled and raw. (Reference No. 592.)

LUBRICATING, ANIMAL AND VEGETABLE OILS.—A Swiss firm at Basle desire to enter into relations with United Kingdom exporters of mineral lubricating oils, gas oils, benzine, petrol, animal oils, vegetable oils, and rosin, with a view to acting as agent or to purchase on their own account. (Reference No. 593.)

COPPER SULPHATE.—A Spanish commission agent of Vigo desires to secure the representation of a British firm exporting copper sulphate. (Reference No. 589.)

ASBESTOS, CHEMICALS, ETC., FOR LITHUANIA.—A firm of merchants and agents in Kovno, desire to secure the representation for Lithuania of British manufacturers of asbestos sheets and packings for industrial purposes, caustic soda, talc, and fats for soap factories, brewing machinery, filters, etc. for breweries, coal tar, etc. (Reference No. 571.)

WHITING AND CHINA CLAY.—A firm of agents in Reading, Pa., U.S.A., wish to communicate with British producers and exporters of whiting and china clay, with a view to obtaining agencies, on a commission basis, for the States of Pennsylvania, New Jersey and New York. (Reference No. 596.)

Revival in Potash Production in Russia

THE repair of the Kuban potash factories is being taken energetically in hand. The production of potash at one time was a leading branch of industry in the south-east of Russia, and was mainly concentrated in Kuban, where the potash produced acquired a reputation equal to that of foreign production. It contains up to 92 per cent. of salt, while the level of the foreign product is only 87 per cent.

Tariff Changes

IRAQ.—The import duty on saccharin and other sweetening substances in a concentrated form is now 25 per cent. *ad valorem*.

POLAND.—A "manipulation fee" had been introduced in addition to the customs duties both on imported and exported goods. The following are, however, exempt:—Coal, brown coal, charcoal, peat coal, briquettes, coke, peat, articles in the frontier tariff, and articles covered by Article 268 (*b*) of the Treaty of Versailles.

Cyanuric Triazide as a Detonator

TESTS of the detonating properties of cyanuric triazide, made by the American Department of the Interior at the Bureau of Mines experiment station at Pittsburg, showed that this compound is a very efficient detonating agent, but is too sensitive to handle safely in large quantities. It is especially sensitive in the form of large crystals such as may be formed from fusion or re-crystallisation. It is non-poisonous in itself, but the materials used in its manufacture are irritating and poisonous. Cyanuric triazide was discovered and patented by Mr. Erwin Ott, and on account of his claims the Bureau of Ordnance of the U.S. Navy desired more complete data, so an investigation was made by the Bureau of Mines. The results obtained were such that the Bureau of Ordnance recommended publication thereof for the benefit of the explosives industry.

Cyanuric triazide is insoluble in water and slightly soluble in cold ethyl alcohol, but it is soluble in acetone, benzene, chloroform, ether, and hot alcohol. It melts at 94° C., and there is decomposition when heated above 100° C. In the molten state it is very sensitive to friction. If heated slowly it may entirely decompose without detonation, but detonates quickly by flame or sudden heating. The small crystals are more sensitive to impact and friction than mercury fulminate and have detonated when being pressed in a detonator capsule. The large crystals, such as may be obtained from fusion or re-crystallisation, have detonated when broken by a rubber policeman.

The complete paper has been issued as Serial 2,512, "Preparation and Detonating Properties of Cyanuric Triazide," by C. A. Taylor and Wm. H. Rinkenbach, and may be obtained from the Department of the Interior, Bureau of Mines, Washington, D.C.

The Association of British Exhibitors

THE Association of British Exhibitors ("limited" omitted by license) was registered on November 23 as a company with an unlimited number of members, each liable for £1 in the event of winding-up, to protect the rights and interests of companies, firms and persons who make a practice of participating in exhibitions, etc. The management is vested in a countil, the first members of which are:—R. O. Ackerley, exhibition manager, General Electric Co.; C. E. Aldridge, salesman, Staines Kitchen Equipment Co.; E. C. Balmforth, manager, Cuirass Products; A. T. B. Bell, managing director, Plaster Paint; W. J. NcNab, manager, Noiseless Typewriter Co.; L. N. Mills, managing director, L. N. Mills and Co.; F. Pascall, managing director, Interoven Stove Co.; C. I. L. Percival, managing director, Physikurate; J. Ramsay, assistant manager, Kiwi Polish Co. Proprietary; F. J. Robinson, company director; W. E. Styles, managing director, Autofex Engineering Works; A. W. Trevarthen, assistant manager, Spratts Patent. A. Webber, assistant sales manager, John Knight, Ltd.; G. J. Woods, advertising manager, Allen and Hanbury's. The secretary is Mr. E. C. Balmforth, and the registered office is at 69, Victoria Street, London, S.W.

Closing of a Selby Oil Mill

THE OLYMPIA OIL MILLS at Selby, stated to be the largest oil mills in the world, had to be closed last week on account of the sinking of an oil tanker in the fairway of the Ouse. The supply of linseed and palm kernel having finished at the week end, hundreds of oil millers and pressers were temporarily thrown out of work. The mills crush about one hundred tons per day, and operations had to be suspended until the obstruction had been removed.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

County Court Judgments

[*NOTE.—The publication of extracts from the "Registry of County Court Judgments" does not imply inability to pay on the part of the persons named. Many of the judgments may have been settled between the parties or paid. Registered judgments are not necessarily for debts. They may be for damages or otherwise, and the result of bona-fide contested actions. But the Registry makes no distinction of the cases. Judgments are not returned to the Registry if satisfied in the Court books within twenty-one days. When a debtor has made arrangements with his creditors we do not report subsequent County Court judgments against him.*]

BISSELL, Mr. S. S. J., trading as WOODBROOK DRUG CO.), Vale Place, Merridale Street, Wolverhampton, drysalter. (C.C., 1/12/23.) £26 14s. 11d. October 24.

BOOTH, Mr. T. A., Idle, wholesale manufacturing druggist. (C.C., 1/12/23.) £89 14s. October 3.

JONES (EVAN) SON AND CO., LTD., The Red House, Cowell Street, Llanelly, manufacturing chemists. (C.C., 1/12/23.) £22 1s. 4d. October 24.

KENDALL, CHAS. AND CO., Gildersome, cod liver oil manufacturers. (C.C., 1/12/23.) £39 5s. 6d. October 10.

RIDLEY, Mr. J. F., Scholars Green, chemical manufacturer. (C.C., 1/12/23.) £28 8s. 11d. October 23.

SILVER BADGE POLISH CO., 49, Abbotts Road, Southall manufacturers. (C.C., 1/12/23.) £18 3s. 4d. Otcober 23.

Receivership

ABBEY CO., LTD. (R., 1/12/23.) P. S. Booth, of 28, Kimberley House, Holborn Viaduct, E.C., was appointed Receiver on November 14, 1923, under powers contained in debentures dated March 4, and 24, 1921.

Mortgages and Charges

[*NOTE.—The Companies Consolidation Act, of 1908, provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every Company shall, in making its Annual Summary, specify the total amount of debts due from the Company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.*]

FRATER (GEORGE A.) AND CO., LTD., Gateshead, paint manufacturers. (M., 1/12/23.) Registered November 14, £6,000 mortgage to building society; charged on property, at South Shore, Gateshead. *£5,250. March 14, 1923.

MORRIS (P.) AND CO., LTD., Liverpool, paint manufacturers, etc. (M., 1/12/23.) Registered November 20, £5,008 mortgage to building society; charged on premises being 168 and 169, Briggate, and in Queens Court, Leeds. *Nil. May 29, 1923.

PETROLEUM PRODUCTS, LTD., Liverpool. (M., 1/12/23.) Registered November 16, second debenture securing all moneys advanced by or owing to the holders, Bickersteth Baker and Co., Tower Building, Liverpool, general merchants; general charge (subject to existing debentures). *£750 debenture. December 31, 1921.

PHARMACISTS' MUTUAL SUPPLY ASSOCIATION, LTD., Leeds. (M., 1/12/23.) Registered November 12, £3,500 debentures; general charge. *Nil. December 23, 1922.

SHARDLOW CHEMICAL CO., LTD., Beeston. (M., 1/12/23.) Registered November 17, £7,250 debenture to F. W. Chambers, High Street, Long Eaton, paper merchant and another; general charge.

WALKER (J. B.) AND CO., LTD., Hull, oil refiners. (M., 1/12/23.) Registered November 20, £1,000 debentures part of £8,000; general charge. *£9,758. June 1, 1923.

Satisfactions

ROLLS AND CO., LTD., London, N., paint manufacturers. (M.S., 1/12/23.) Satisfaction registered November 19, £150, balance of amounts registered October 13, 1902, and February 11, 1903.

SOMERSET OXIDE AND OCHRE CO., LTD., Bristol. (M.S., 1/12/23.) Satisfaction registered November 15, all moneys, etc., registered June 20, 1921.

London Gazette

Company Winding Up

CARLTON BLEACHING AND DYEING CO., LTD., Marhill Road, Station Road, Carlton, Notts. (C.W.U., 1/12/23.) Last day for receiving proofs for intended dividend, December 12. Liquidator, Charles John Pain, 18, Low Pavement, Nottingham.

Companies Winding Up Voluntarily

EASTERN OIL MANUFACTURING CO., LTD. (C.W.U.V., 1/12/23.) C. Findlay, 13, Fenchurch Avenue, London, E.C., appointed liquidator. Meeting of creditors at 13, Fenchurch Avenue, December 4, at 11 a.m. Creditors' claims by December 11.

NEEDHAM'S, LTD. (C.W.U.V., 1/12/23.) H. D. Woolger appointed liquidator, and transfer of the undertaking and assets to Squire and Co. (Birmingham), Ltd., approved.

UNITED CHEMICAL MANURE CO., LTD. (C.W.U.V., 1/12/23.) H. H. Keddell appointed liquidator.

New Companies Registered

CALUMITE LEAD PRODUCTS, LTD., Calumite Works, Linwood, Renfrew. Manufacturers of and wholesale and retail dealers in chemicals, chemical compounds, pigments, dyes, oils, paints, etc. Nominal capital, £10,000 in £1 shares.

DANISH SOAP INDUSTRY, LTD., 49A, Old Bailey, London, E.C. Soap makers, and perfumers, etc. Nominal capital, £5,000 in £1 shares.

PHOSALINE (1923), LTD., Provident Chambers, 51, Wardwick, Derby, wholesale, retail, manufacturing and dispensing chemists and druggists, etc. Nominal capital, £200 in £1 shares.

SENIOR, CROZIER AND CO., LTD., Union Works, Union Street, Stratford, E. Wholesale and retail chemists and druggists. Nominal capital, £5,000 in £1 shares.

SILVER DRUG SUPPLY CO., LTD. Manufacturers of, agents for and dealers in all kinds of drugs, chemical substances, pharmaceutical products, etc. Nominal capital, £1,000 in £1 shares. Solicitor: T. Yates, 46A, John Dalton Street, Manchester.

Sulphuric Acid of Indian Manufacture

AT a recent meeting of the Indian Tariff Board, the Metallurgical Association pressed for the abolition of the duty on raw sulphur. It was stated that India was paying for her sulphur at least double the price paid by her competitors, with the result that such sulphur as she had to import was purchased at a c.i.f. figure higher than obtained in any of the other acid-manufacturing countries of the world. The bulk of the acid produced was used in the manufacture of sulphates, *e.g.*, sulphate of ammonia, the consumption of which in India itself was fractional. Its markets were to be found in Java, Mauritius, and the Far East, and sulphate manufacturers had at times found it practically impossible to meet competition from England, America, and Germany. The Association also urged that finished products manufactured from sulphuric acid, the chief of which were chemical manures, should no longer be admitted into India duty free.

Canadian Exports of Paper and Woodpulp

THE total value of the exports from Canada during the twelve months ended September 30 of wood and its products, including paper, was $261,214,852, as against $202,221,473 in 1921-22, shipments including:—

	Quantity. cwts.	Value. $
Paper, total exports	—	89,743,764
Paper, newsprint	22,016,217	81,950,919
Woodpulp, chemical	10,950,320	36,014,681
Woodpulp, mechanical	6,754,679	10,959,140